MARCH/APRIL 1995

PRACTICAL WINERY & VINEYARD

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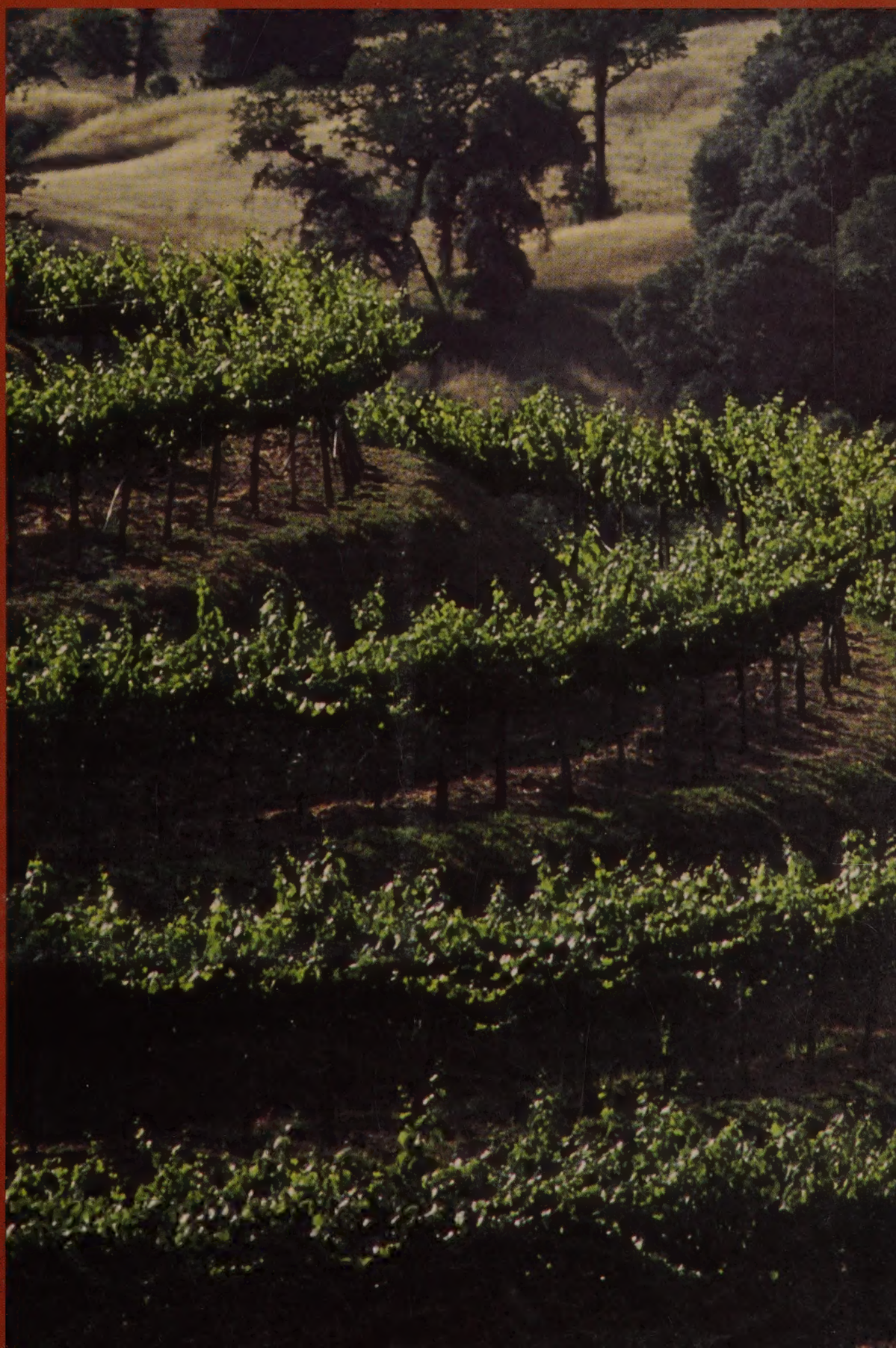

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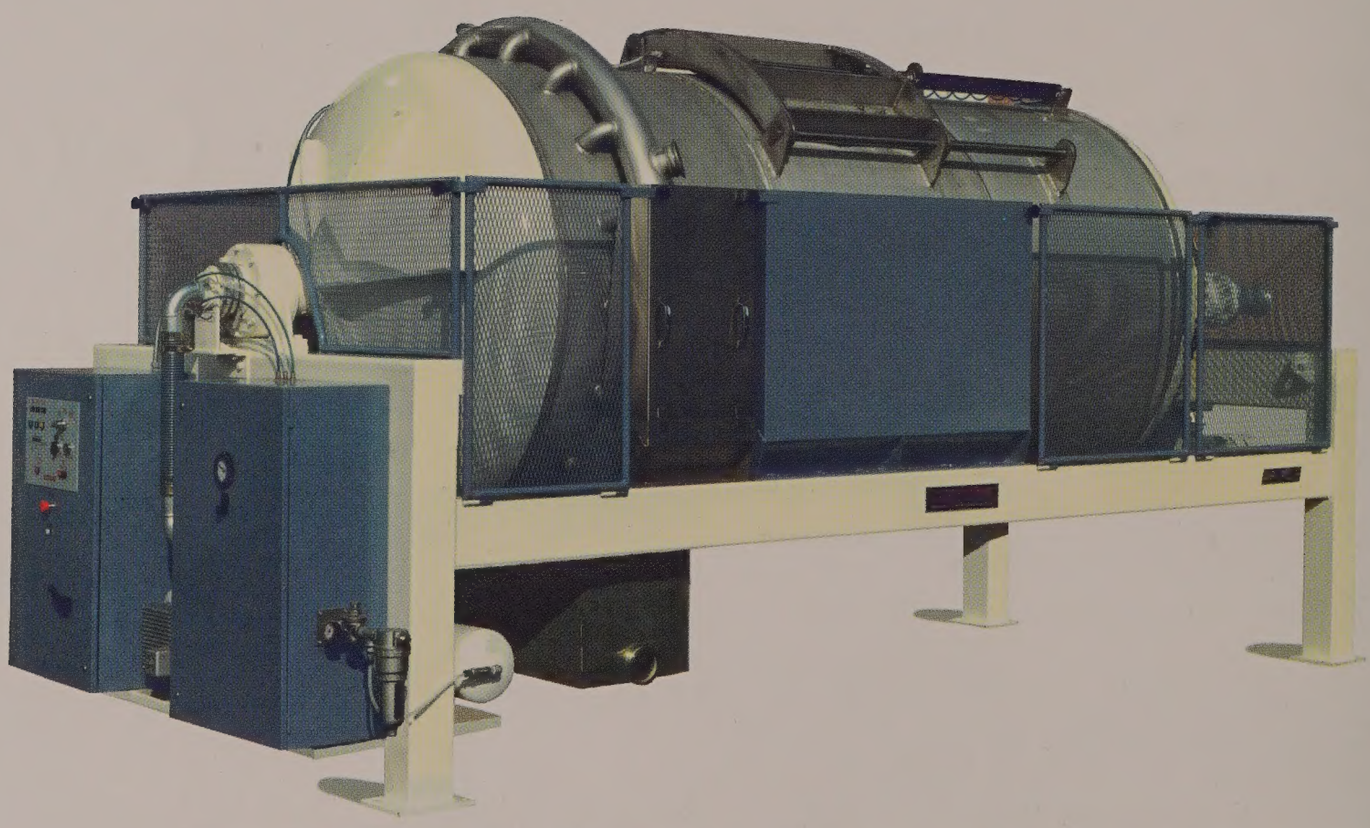

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by Agustin Huneeus,
Franciscan Vineyards, Oakville, CA

Varietalism

Wineries in the United States have developed their markets using the grape variety from which a wine is made to distinguish it from other wines. This used to be a fairly unique identifier for U.S. wines as all other wines of the world (Old World) were identified by a place name or appellation.

Today, however, in order to penetrate the wine market in the U.S., wineries in foreign countries use the varietal identifier as much as U.S. wineries do.

By emphasizing the varietal name over its appellation, U.S. wineries have done both consumer and producer a large disservice. The consumer has been led to believe that there is uniformity in varietals regardless of origin. This, of course, is not true.

By emphasizing the varietal, U.S. wineries have opened the market to anyone in the entire world who can grow these varietals that we promote or even those who can't. Nobody can produce a Mt. Veeder wine or an Oakville wine or a Monterey County wine, but everybody in the world can produce a Chardonnay, Cabernet, or Merlot.

The effect of this situation is that most wines from other nations sold in the U.S. market emphasize the varietal name, and it takes a detective to determine where they originate. Names such as "Marcus James" and "Walnut Crest" certainly are intended to confuse the consumer into believing that these are California wines.

But more alarming than the competition U.S. wineries are getting and are about to get from varietals that are grown in other countries, is the fact that the varietal name is being used in different ways by different countries.

Legal issues

In the United States, labeling laws are very strict. In order to bear a varietal name, 75% of the wine in the bottle must come from the grape variety on the label. In other countries, different rules and different ethics prevail. There is no assurance that an imported wine labeled Chardonnay or Merlot is a minimum of 75% varietal content. Though varietally labeled French wines must be 100%, there is no assurance that there is any of a promised grape variety in the wines from many other countries. The veracity of labeling which is so strong in the U.S. does not exist in the same way in many of the countries competing in the U.S. market.

The first alarm came a few years ago when huge amounts of a popular varietal wine were coming from one country, and nobody could testify to ever having seen a vine of that variety in that country. This led the Bureau of Alcohol, Tobacco & Firearms to make an inquiry. The inquiry went through diplomatic channels. Now one has to be very naive to think that the state department of any country will accuse its industry of falsifying records, especially if this classification doesn't hurt the consumer at all and, in fact, promotes exports.

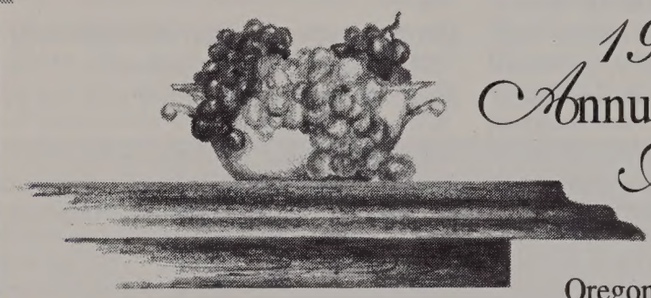
Furthermore, no records mean no control. Because varietal composition has never been an issue, some countries' officials have no records or interest in the varietal composition planted in their vineyards.

A facetious slant

Wine Spectator's writer Matt Kramer. says:

> Everyone knows that *Chardonnay* and *Cabernet Sauvignon* have become American synonyms for white wine and red wine. Everyone knows that numerous terrific wines do not sell easily, if at all, for want of the right name. So

Continued on page 59



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Estimating yield for wine grapes

by Sara E. Spayd, Robert L. Wample
Extension Food Scientist, Horticulturist, Irrigated Agriculture Research & Extension Center, Washington State University, Prosser, WA

Wine grape growers need to be able to estimate fruit yields for several reasons. Fruit and vine maturation are delayed by excessive crop size. Wineries often specify yield levels. At harvest, grapes may be rejected or monetary penalties instituted if yields exceed contracted levels. Conversely, growers need to produce grape yields sufficient to provide a reasonable profit. Compensation for reduced yields is also an option.

Crop regulation begins during the dormant season by pruning to specific levels. Crop level can further be adjusted downward by thinning during the growing season. The following information can help wine grape growers estimate yields. It can only serve as a guide. Accuracy in estimating yield is only as good as the precision of the data used in the calculations.

Dormant season crop management

Missing vines and cordons — A vast majority of, if not all, vineyards are not "perfect." Missing or weak vines and cordons are a reality. The first step in yield estimation is to determine the actual number of vines in the vineyard block.

Table I has some standard vine numbers/acre based on several different spacings. If 50% of the vines are missing, a 5-ton/acre (t/a) crop contract would be the equivalent of producing 10 t/a for the root systems of vines existing in the vineyard. If canopy lengths of those remaining vines are doubled by cordon extension, similar crop loads (yield to pruning ratio) would be maintained. (Note: Even if the canopy is expanded, there is still only 50% of the root system to support the tonnage.)

If one vine is missing, the vines bordering the empty space will produce about 25% more fruit than normal. In this instance, extending the cordons of adjacent vines to fill the empty trellis is recommended because single missing vines that are replanted are difficult to establish. Replanting or layering should be done if there are two or more adjacent missing vines.

Missing cordons also represent a similar situation. Vines planted on a 6-ft. x 10-ft. spacing occupy 4,356 feet of cordon space per acre with non-divided, or single canopy training systems. A crop level of

Table I
Nodes per vine to leave at pruning to achieve specific crop levels based on cluster weight.

SPACING	PLANTS	LBS per VINE				CLUSTER WT (lbs.)	NODES per VINE*			
		4-tons	5-tons	6-tons	7-tons		4-tons	5-tons	6-tons	7-tons
6 X 8	908	8.8	11.0	13.2	15.4	0.50	9	11	13	15
						0.40	11	14	17	19
						0.30	15	18	22	26
						0.25	18	22	26	31
6 X 10	726	11.0	13.8	16.5	19.3	0.50	11	14	17	20
						0.40	15	18	23	26
						0.30	18	22	27	31
						0.25	22	28	34	40
7 X 10	622	12.9	16.1	19.3	22.5	0.50	13	16	20	23
						0.40	17	22	26	30
						0.30	21	26	31	36
						0.25	26	32	40	45
8 X 12	454	17.6	22.0	26.4	30.9	0.50	18	22	26	31
						0.40	22	28	33	39
						0.30	29	37	44	51
						0.25	35	44	53	62

This assumes an average of two clusters/primary bud (shoot).

five tons/acre (10,000 lbs/726 vines) represents a yield of about 13.8 lbs/vine or 2.3 lbs/foot of cordon. Missing or weak vines and cordons should be replaced. Weak cordons may be defruited to help re-establish the cordon.

Achievement of designated tonnages by leaving additional nodes/vine on existing vines to compensate for missing vines without increasing canopy length is not recommended. Besides potential crop level related stress, missing vines are an economic inefficiency since land, labor, and spray materials are wasted on nonproductive land.

Nodes/vine — Yield can be partially regulated at pruning by adjusting the number of nodes/vine (nodes usually contain 3 buds). When determining the number of nodes to leave to achieve a specific crop level, node productivity and the range in cluster weight for a given cultivar need to be considered. Table I provides recommendations for the number of nodes required to achieve 4, 5, 6, or 7 tons of grapes/acre for different average cluster weights. Due to clonal differences, varying light regimes in different training systems, etc., growers are strongly encouraged to develop their own historical cluster wt. averages.

For example, with a 6-ft. x 10-ft. spacing, there are 726 vines/acre. Assuming no missing vines and an average cluster weight of six ounces (0.38-lb.), a yield of 5 t/a would require 13.8 lbs of fruit or about 37 clusters/vine. To achieve this yield, the grower should consider the average number of clusters produced per primary bud. Assuming an average of two clusters/primary bud and that all buds are productive, about 18 nodes/vine should be left at pruning to achieve the desired 5 t/a crop.

It should be noted that for most cultivars, two clusters per node may be high in most years, except for White Riesling. Table II shows the average number of clusters/shoot and cluster weight for cultivars grown in the Yakima Valley of Washington state for one year at one location.

Secondary and sometimes tertiary buds within a single node can be fruitful. For example, Pinot noir nodes at WSU-IAREC were observed in some years to produce on the same node position: four clusters/primary shoot, three clusters/secondary shoot, and two clusters/tertiary shoot. If these clusters had not been removed, crop size would have been about twice as high as that predicted at pruning, based on the number of nodes/vine.

Winter injury — If you grow grapes in California, you can probably skip this next section. But for grapegrowers elsewhere in North America, before final adjustment of node number at pruning, the vineyard should be evaluated for winter injury. If there has been winter injury or there was excessive mechanical injury during harvest, growers can compensate for the percentage of primary buds lost.

Estimating winter injury is best accomplished when there is little threat of further injury. However, this is not always possible, especially for large acreages or where spring frosts may intervene.

To estimate cold injury before pruning, a grower should collect at least 100 nodes per five to ten acres for each cultivar and location. Sample nodes that would typically be left at pruning (i.e. don't select nodes from node positions six to ten if nodes two to four are left during pruning). Generally, the first node position is unproductive. Therefore it is not included in node counts at pruning.

Sampling should also represent the block, not just the cold pockets. Sample cold pockets separately.

Place the canes in plastic bags and bring them inside for at least 24 hours and preferably 48 hours at 65°F to 70°F. Cut across the width of the compound bud from the top to the base until the primary, secondary, and tertiary buds can be observed. This takes some practice. It helps to have a magnifying glass, although often if the bud is damaged it will be dark brown or black as opposed to the emerald green of live buds.

Record the number of dead or damaged buds and the total number of buds examined and calculate the percent bud loss. Use this to adjust the number of buds needed to achieve a desired yield. Table II shows the relative productivity of some wine grape cultivars in the Yakima Valley. Fruitfulness can vary widely between cultivars and years.

Data in Table II were based upon simulated winter injury by removal of primary shoots after primary bud break. However, it illustrates cultivar differences in fruitfulness of the secondary and tertiary buds. Some cultivars, such as Lemberger and Meunier, produce a small crop from secondary buds. However, some cultivars, such as Cabernet Sauvignon and Chenin Blanc, produce almost no crop. Even in years of little to no winter injury, growers should monitor the development of shoots and subsequent clusters from secondary and tertiary buds.

To convey an idea of bud survivability of some wine grape cultivars, Table III contains data from Clore et al. (1974) showing bud injury following sub-zero temperatures in 1972. After the winter injury incurred in the winter of 1990-91, Wade Wolfe (1991) recommended that

Table II
Fruitfulness of primary and secondary buds of wine grapes in the Yakima Valley.[Z]

	PRIMARY BUDS		SECONDARY BUDS		
CULTIVAR	Clusters/ shoot	Cluster wt. (lbs)	Clusters/ shoot	Cluster wt. (lbs)	SBP[Y] %
Reds:					
Cabernet Sauvignon	2.3	0.10	0.50	0.02	4
Lemberger	2.0	0.34	1.20	0.15	26
Merlot	2.1	0.25	1.33	0.05	13
Meunier	2.0	0.28	1.33	0.12	29
Pinot Noir	2.2	0.19	1.13	0.06	16
Whites:					
Chenin blanc	1.7	0.27	0.33	0.05	4
Gewurztraminer	2.0	0.19	0.67	0.08	14
Semillon	2.2	0.43	0.60	0.22	14
Riesling	2.3	0.24	1.20	0.04	9

[Z] Data extracted from: Wallace, M. 1973. Productivity of shoots from secondary buds. Proc. Wash. State Grape Society. 31-35. (Evaluations conducted May 8 to May 25, 1973. Primary shoots were removed to simulate injury.)

[Y] Secondary bud productivity [SBP (%)]=[(ave. clusters/secondary shoot x ave. wt. secondary clusters)/(ave. clusters/primary shoot x ave. wt. primary clusters)] x 100.

Table III
Grape cultivar evaluation of buds following the December 1972 subzero temperatures.[z]

CULTIVAR	PERCENT BUD KILL PRIMARY	SECONDARY	TERTIARY
Reds:			
Cabernet Sauvignon	19-41	2-24	2-10
Grenache	55-96	27-88	12-82
Lemberger	38	4	0
Merlot	22-26	0-12	0-6
Meunier	4-6	0-6	0
Pinot Noir	0-30	0-30	0-26
Whites:			
Chardonnay	10-33	2-14	0-4
Chenin blanc	18-44	2-24	0-14
Gewurztraminer	4-24	5-32	0-14
Sauvignon blanc	6-12	9-24	7-20
Semillon	10-52	2-54	0-18
Riesling	8-45	3-28	0-13

[z] Data extracted from: Clore, W.J., M.A. Wallace, and R.D. Fay, 1974. Bud survival of grape varieties at sub-zero temperatures in Washington. Am. J. Enol. Vitic. 25: 24-29.(Note: A low temperature of -7°F occurred on December 14, 1972. Data presented are composites of vines of different ages and at several locations. Please refer to original article for more details.

the crop potential (CP) be estimated using the formula:

CP = (% live primary buds + 0.25 [% live secondary buds])/100

Adjusted bud number = Normal bud number/CP

The typical yield is then multiplied by the CP for an estimated crop yield for the year. As the CP approached zero (total crop loss), the formula was not usable.

As a general guide, Wolfe (1991) recommended the following:

1) less than 25% primary bud damage = no adjustment

2) 25% to 40% primary bud damage = use above formula

3) 40% to 60% primary bud damage = increase bud count by 50%

4) 60% to 75% primary bud damage = increase bud count by 75%

5) greater than 75% primary bud damage = hedge-prune.

These are only *guidelines*. Where many compensatory nodes are left, shoot and crop development in the spring should be very closely monitored to avoid overcropping.

Growers should also be aware that base buds present on short spurs or renewal spurs may be productive. If such buds are well-developed, they can be productive. This could add significantly to the estimated yield and should be considered as these shoots develop.

Compensation for potential losses — Compensating for future crop losses by retaining extra nodes/vine is not recommended since it can lead to overcropping. If a grower is very concerned about possible losses from frost, cutworms, wind or other mechanical damage, additional buds can be retained. However, if those losses do not occur, a grower should be prepared to remove some of the fruit and/or shoots to achieve the desired crop size.

Growing season adjustments

Dormant season pruning alone will not eliminate the need for crop estimation and possible adjustment during most growing seasons. Minimal injury during the winter and/or spring and good environmental and viticultural factors for fruit bud growth and development, as well as fruit set, can increase crop size beyond desired levels. Therefore, crop adjustment during the active growing season will probably be required.

Environmental conditions from the previous as well as the current growing season impact yield. A good example of climate resulting in high production culminated with the record Washington harvest in 1993. This record harvest was marked by high bud fruitfulness, increased berries/cluster, and increased berry and cluster weight.

The spring of 1992 was ideally suited to initiation of fruit buds for the 1993 crop. Temperatures were warm and soil moisture was ample. Conditions were also ideal for minimal injury since temperatures declined quite slowly to the winter minimum. There was no midwinter warm spell to trigger deacclimation, and the rise from midwinter hardiness levels to bud burst was gradual with no significant spring frosts.

During the spring of 1993, temperatures at bloom were moderate and ideal for good fruit set. Temperatures from fruit set to veraison were unseasonably cool, but ideal for cell division within the grape berries. The weather remained cool through veraison and into the third week of September. During this period fruit growth continued via increased cell size. Berry size was larger than normal despite the very large crop. This was likely due to the increased cell number and the cool weather which decreased potential losses in berry cell volume due to transpirational water loss.

Determine crop potential — Before bloom, the actual number of clusters per vine needs to be estimated. Steve Price at Oregon State University recommends counting at least 20 vines/block, more is better, in either a random pattern or a grid. Prebloom yield (t/a) estimate is calculated as vines/acre x clusters/vine x average cluster weight.

Yield = (NV x NC x CW)/2000,

where:

NV = number of vines/acre = (43,560 sq.ft./acre) / (in row spacing x between row spacing) or preferably an actual count of number of vines/acre

NC = number of clusters/vine (count actual clusters/vine on at least 20 vines/block)

CW = predicted cluster weight at harvest in pounds

2,000 = lbs/ton

For ***PWV***-readers, the discrepancy between Table II (cluster weights in Yakima, i.e. 0.10 lbs for Cabernet), and Table IV (cluster weights in eastern Washington, i.e. 0.30 - 0.40) should be used as an example of the need for each vineyard to establish its own range of cluster weights.

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Average cluster weight varies greatly between cultivars, years, and growers. Table IV shows cluster weight ranges for various cultivars. If cluster thinning is done, cluster counts should also be made later during the season. Growers should monitor the quality of the thinning job as it is being done. For large acreages, veraison or post-veraison cluster counts or re-estimations of yield could be futile due to the timing and cost of thinning again.

Table IV
Average cluster weights for *Vitis vinifera* cultivars in eastern Washington

CULTIVAR	CLUSTER WT. (lbs.)
Reds:	
Cabernet Sauvignon	0.30 - 0.40
Cabernet Franc	0.40 - 0.45
Lemberger	0.40 - 0.50
Merlot	0.30 - 0.45
Whites:	
Chenin blanc	0.40 - 0.50
Gewurztraminer	0.25 - 0.30
Muscat Canelli	0.40 - 0.50
Sauvignon blanc	0.25 - 0.30
Semillon	0.40 - 0.50
White Riesling	0.25 - 0.30

Growers should monitor cluster weights for each block of a given cultivar every year. Records should be maintained so comparisons can be made from year to year. As a minimum, cluster weight at harvest should be determined. Price recommends sampling 50 clusters in a random pattern from at least 20 different vines.

Cluster weights from harvest bins should not be used unless vines are completely harvested by hand and cluster number and yield/vine recorded. During random sampling, some care should be taken to sample across all cluster positions. Generally, basal clusters are larger than others on the shoot. If too many basal clusters are sampled, yield will be overestimated. If too few basal clusters are sampled, yield will be underestimated.

Measurements of cluster weight before harvest would allow growers to adapt yield estimates for variances due to vintage. In most years, cluster weights of Pinot Noir in Oregon at the lag phase of berry growth are multiplied by a factor of 2.2 to estimate final cluster weight (see Price).

Data from WSU-IAREC for Cabernet Sauvignon, Chardonnay, Chenin Blanc, Gewruztraminer, Lemberger, Pinot Noir, and White Riesling show that berry weight at 8° to 10° Brix is about 50% to 60% of the maximum weight (i.e. cluster weight is about 50% to 60% of maximum). Therefore, cluster weight at 8% to 10% soluble solids could be multiplied by 1.7 to 2.0 to estimate final cluster weight. Some clones of Chardonnay in some years have many shot berries. This would add to the difficulty in estimating yield.

Berries per cluster

The major factor contributing to cluster weight is the number of berries per cluster. We do not have an extensive database upon which to make evaluations. Although it would be very helpful to know the average number of berries per cluster for each cultivar, this is complicated by variations with which cluster is being considered, which clone, by the season, and perhaps with the number of flowers formed during the previous year. If we had this information, it would improve our ability to predict final cluster weights and therefore yield.

However, since we do not have the above information for each cultivar, the best procedure to follow is to establish average cluster weights rather than berries per cluster. This may be particularly true since berry weight often may increase in compensation for fewer berries per cluster.

Cluster thinning — Quite often, cluster thinning is recommended over shoot thinning. Cluster thinning is far more effective in reducing crop size because the shoot thinning process often results in removal of unfruitful base shoots. Shoot thinning during the active phase of shoot growth will only stimulate growth of the remaining shoots. This can result in excessive fruit shading and impede airflow through the canopy. Some shoot thinning after berry set can be effective without generating new growth. This would involve removal of weak shoots with and without clusters and auxiliary shoots, if present. It must be realized that this practice may have a significant impact on fruit environment, but a relatively small one on crop size.

Cluster thinning prior to bloom can

result in increased berry set on the remaining clusters, thereby reducing the impact of thinning on yield reduction and increasing the risk of cluster compaction and bunch rot. However, vines will not necessarily be overcropped thereafter; vine size usually increases and fruit maturity is often accelerated.

If reduction in crop size is desired, it is recommended that cluster thinning be done midway between fruit set and veraison. In so doing, berries/cluster are reduced, and mean cluster weight, hence overall crop size, are ultimately lowered. Cluster thinning should occur before the onset of veraison to assure proper fruit maturation, particularly in cool growing seasons.

Figure 1 shows the yield for various vine spacings based on the number of clusters/vine and average cluster weight. First estimate the average cluster weight for your situation. Using your vines/acre count (actual) and your estimated number of clusters/vine, a grower can get a rough estimate of your potential yield/acre. If estimated crop exceeds desired crop, the grower can remove a calculated number of clusters/vine to reduce yield to the desired level.

Summary

Yield is the result of several interdependent factors. Vine spacing which determines number of vines/acre influences the number of nodes/vine which

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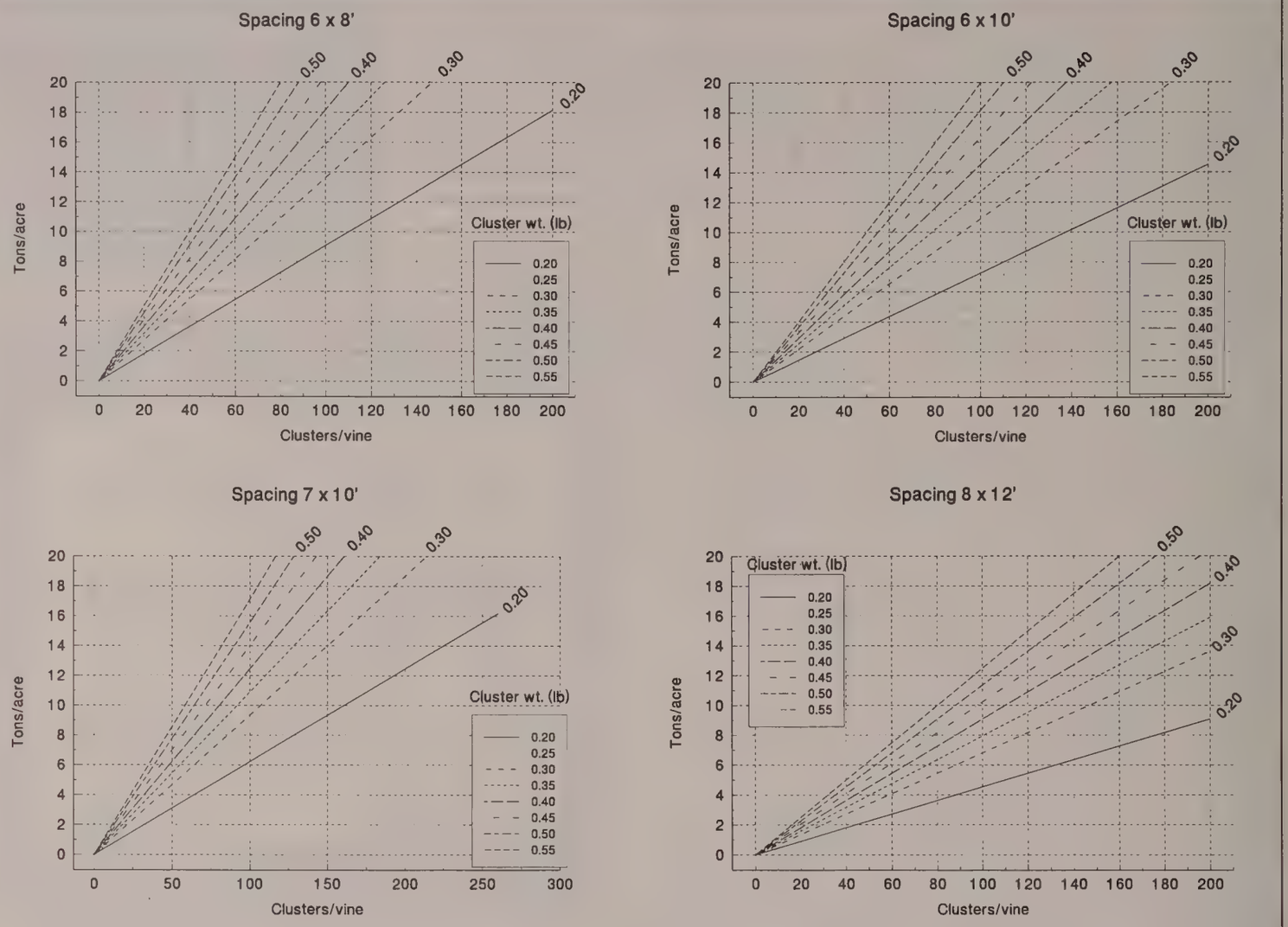
Figure I Yield for various vine spacings



are left at pruning. Nodes/vine, in turn, influences the number of shoots/vine, although shoots do develop from noncount buds. The number of clusters/vine is affected by the number of shoots/vine and the fruitfulness of the buds on those shoots.

Within reason, the number of berries/cluster is probably primarily influenced by fruit set rather than the initial number of flowers/cluster. A reduction in number of flowers/cluster has been noted to be offset by an increase in percent fruit set. Berry weight varies and can be influenced by crop size, climate, and viticultural practices, particularly irrigation.

Grape growers can control the number of vines/acre and the number of nodes left on the vine. In Washington state and other reigons with cold winters, the number of productive nodes/vine is dependent on cold injury. If pruning is delayed, the node number can be adjusted to compensate for damage.

The number of shoots/vine is influenced by the number of nodes/vine, number of buds/node that develop, and development of latent buds on the cordon. Shoot number can be reduced by thinning and cordon suckering.

Within a cultivar, the number of clusters/shoot and flowers/cluster is influenced by climatic conditions during the previous growing season when buds were developing. Clusters/vine can be adjusted downward by the grower during the vegetative portion of the growing season.

As previously mentioned, pre-bloom cluster thinning will favor vegetative growth while post bloom-veraison thinning will favor fruit development.

Grape growers should develop a system for monitoring yield, clusters/vine, and cluster weights in each vineyard block. Seasonal, varietal, and viticultural variables should be considered in yield estimation. It is difficult to precisely estimate yield. However, monitoring grape development throughout the season and over many years would improve the degree of precision in yield prediction. ■

Literature cited

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Wallace, M.A. 1973. Productivity of shoots from secondary buds. Proc. Washington State Grape Society 3: 31-38.

Wolfe, W. 1991. Cold injury panel. Compensation for injury in wine grapes. Proc. Washington State Grape Society 21: 15-16.

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- Rootstock and scion selection
- Preplant preparation
- Vine care and establishment

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Call **Stephan Daniels** at (707) 484-8517 for service in Sonoma, Mendocino, Monterey, San Luis Obispo, Santa Maria and bay area counties.

Call **John Duarte** at Duarte Nursery (209) 531-0351 for service in Stanislaus, Merced, Madera, Fresno, Kings and Kern counties or anywhere.

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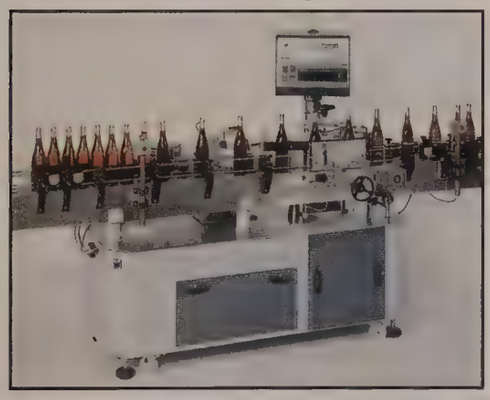
ASSOCIATED WINERY SYSTEMS, INC. (AWS)

AWS, Inc., specializing in GAI bottling equipment, Della Toffola filters and presses, and specialty pumps, has experienced astounding sales increases in pressure-sensitive label applicators.

AWS introduced pressure-sensitive labelers to the West Coast of the U.S. in March 1991 to small wineries (mostly in the Northwest). Nearly 100 automatic labelers are now in use throughout the West Coast wine industry.



This sales explosion is due to several major factors: ease of use, accuracy of label placement, lack of cleanup labor, and above all, the issue of marketing. Many customers have made label design changes when they changed to pressure-sensitive labels with great success. Some have made split-front label designs and others have introduced new colors, embossing, or foil decoration.

Shape and size are no longer limited by machine limitations and are only a factor of the printing process. Pricing of labels and the availability of a wide array of papers have now become a very competitive business and like all competitive situations, the buyer is the winner. Label cost is comparative to glue-applied labels and more sophisticated labels may even cost less.

This exciting new equipment offers quality applicators, high resolution, and dynamic marketing opportunities to the industry. AWS offers applicators from a semi-automatic operation at 12/bpm to fully automatic rotary labelers at 350/bpm.

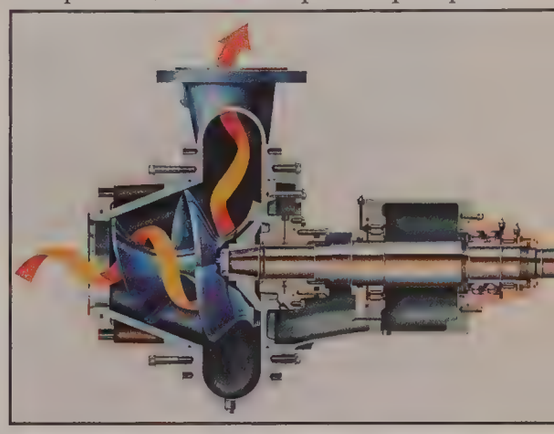
For a complete demonstration, call: **AWS** 800/228-0664.

WEMCO PUMP

WEMCO Pump is a product of EnviroTech Pumpsystems, a world leader in the manufacture of specialty pumps. The WEMCO-Hidrostal pump is especially important to the wine industry because of its ability to gently handle whole grapes, juice, or wine.

The pump's unique screw-centrifugal impeller with a single-vane open channel design allows it to easily move delicate or highly viscous material from suction to discharge without choking or clogging. The screw-centrifugal impeller minimizes shear and transports delicate solids or liquid mixtures with a minimum of damage. Whole grapes move through the pump unbruised.

Side-by-side tests comparing the WEMCO-Hidrostal and paddle pumps, pumping from the crusher to storage, clearly show WEMCO producing an increase in free-run yield from 129.9 gallons per ton to 137.9 gallons per ton over competitive, traditional paddle pumps.



WEMCO-Hidrostal pumps are currently in use in major California wineries and in other delicate food-processing applications. The firm also manufactures Roto-Jet high-pressure pumps for central cleaning operations.

For more information, contact: **WEMCO Pump**, 721 North B St., Sacramento, CA 95814, tel: 916/444-7160, fax: 916/444-0557.

Please see our ad, page 44.

BOSWELL COMPANY

Boswell Company supplies cellar tools to help improve wine quality, including stainless steel racking devices such as the Bulldog's Pup and the "Boswell foot valve."

Retrofitable to existing Bulldog's Pup units, Boswell's prototype barrel-washing accessory allows quick cleaning in

place for accessible barrels in pyramids. Also, a stand is in development now to support the weight of the wine hose and fittings, so the Bulldog tool remains upright. Flex-hose leg Pups are available for very tight spaces.

Used with straight one-inch racking tubes, including the Bulldog's Pup, the Boswell foot valve is a stainless steel cylinder with a Teflon ball inside. With the foot valve, a cellar worker can close off the end of the racking tube with the Teflon ball by shutting off the pump or releasing the gas pressure. Oxygen pick-up is minimized, wine does not backflow into the barrel, and spacer elements at the bottom of the foot valve allow exceptionally clean racking, so fining and filtration can be reduced or eliminated.

Boswell also offers sponge-rubber, hose-cleaning balls. These simple, inexpensive balls are compressed and pushed through wine hoses and transfer lines by water pressure to minimize sanitation problems.

"Our non-oxygenating, highly effective, stainless-steel stirring rod or 'dodine' is a simple, hand-operated mixing tool for barrels. We now offer versions to access virtually any barrel — in pyramids, stationary racks, or metal pallets."

For more information, contact: **The Boswell Company**, 1000 Fourth St., Suite 360, San Rafael, CA 94901, tel: 415/457-3955, fax: 415/457-0304.
Please see our ad, page 18.

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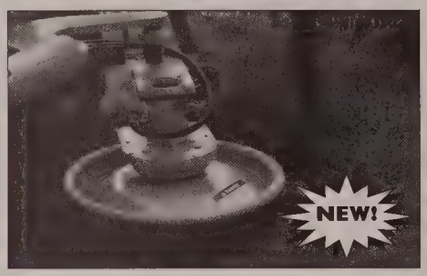
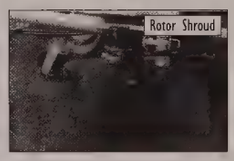


New high-precision in-row Mower. We've got MOW-R than all the rest! Get perfect weed control without herbicides!



Choose from nine models and a variety of packages and options to fit your operation's needs. Change your in-row tiller into a precision mower or sweeper. Kill weeds, move soil, and reshape berms. Work effectively after cane drop with a rotor shroud. The possibilities are limitless! Custom fit your Weed Badger with vineyard or orchard packages.

Don't take our word for it. Experts say Weed Badger in-row tillage and mowing is the cost-effective answer!

"In the final analysis, rotary tilling was the clear winner in petrochemical dollars saved, even with four passes per row and three applications per season."
— Fruit Grower

"Mechanical tillage equipment is making a quiet comeback in the agricultural industry as food safety concerns continue to threaten the future of chemical registrations."
— The Grower

"The Weed Badger deals with weeds of all sizes. Depending on the acreage, it could be the only tool you need."
—Practical Winery & Vineyard

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Carlsen & Associates is a designer and manufacturer of winery equipment with an emphasis on pumps and pump systems. The company offers turn-key systems utilizing the latest methods of technology and is constantly striving to improve products while remaining competitively-priced.

Available are a complete line of Waukesha positive displacement pumps, Yamada double-diaphragm air pumps, Jabsco and Zambelli flexible impeller pumps, and Waukesha or SFP (formerly Valex) centrifugal pumps. Carlsen & Associates also supplies a line of flow meters/batch controllers manufactured by Invalco, Inc., (see photo).

Carlsen systems contain the following standard features:

- Polished stainless steel carts with two or four wheels with pneumatic tires. Units are balanced for ease of movement by one person;
- Sanitary input and output fittings to match existing customer fittings;
- Complete electric control utilizing AC frequency variable-speed drives, DC variable-speed drives, and electro-mechanical starters. All controls mounted in watertight enclosures;
- Totally enclosed fan-cooled motors

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sized to application;

• Full two-year warranty on all materials and workmanship.

For more information, contact: **Carlsen & Associates**, 5228 Aero Dr., Santa Rosa, CA 95403, tel: 707/576-0632, fax: 707/576-7698.

Please see our ad, page 53.

CELLULO CO. *DIVISION OF GUSMER ENTERPRISES, INC.*

Cellulo Co. is a leading supplier of a wide variety of products used in the production of juices and wines. Products manufactured at the company's Fresno, CA facility include: Cellupore® filter sheets for clarifying and sterilizing applications; Cellu-Flo® filter fiber used to form a cake, protect pressure leaf filter screens, reduce diatomaceous earth bleed-through, and as a body-feed to extend the life of filter sheets and paper.

Cellulo is also a leading manufacturer of fining agents, such as Kolorfine® and Klear-Mor®, and Oak-Mor®, which can enhance the oak character of wines without the expense of using oak barrels.

Cellulo has a complete line of sanitary and industrial stainless steel filter housings to accept up to four 12-inch by 16-cell stacks containing Cellupore media. All wetted parts of these housings are manufactured using 316L material. The industrial housing can be supplied to meet ASME-code requirements and is available with or without code stamp.

Cellulo Co. is the exclusive representative for Pacific Press lees filter presses, along with Novo Nordisk enzymes, Nalco colloidal silica, James Vicker's isinglass (flocced, Dryfine, and Cryofine), Condimenta malolactic fermentation (Bitec) starter cultures, gelatin, and Red Star yeast.

Pacific Press lees-type presses are available in sizes from 0.25 cu.ft. to 300 cu.ft. with larger sizes designed to individual customer requirements. All standard presses include a heavy-duty steel fabricated frame, rugged polypropylene filter plates, and one set of reusable polypropylene cloths. Also available are fully automatic hydraulic pump controls, plate shifters, and sludge carts. A press can be trailer-mounted.

Cellulo's technical staff is available to assist with your filtration and separation application needs.

For more information, contact: Phil Crantz, **Cellulo Co.**, 2949 E. Townsend, Fresno, CA 93721, tel: 209/485-2692; fax: 209/485-4254.

THE COMPLEAT WINEMAKER

The Compleat Winemaker (TCW) supplies processing equipment to the wine industry. Available are Compleat Winemaker-designed transfer pumps with Jabsco or Zambelli pump heads (up to 125-gpm), Ragazzini piston and peristaltic pumps for must and pomace, and Flowtech rotary lobe pumps for must and transfer. Other pumps include TriClover centrifugal and rotary lobe; Aro, Sandpiper, and Wilden air diaphragm; Madden metering; and Aro and Grover air piston.

TCW has crushing and pressing

Portrait of the Artist's Mother (detail) by Albrecht Dürer dated 1514.

We hunt and buy oak the way many grandmothers would shop for peaches. We're called StaVin, and in our journeys deep into the heart of France, through the ancient forests of Loches, Nevers & Lemans we've found the creme de la creme of mature French oak. The selected timber we treat like a food, from our strict toasting process, after centuries old *tonnelier* methods, down to the way we vacuum seal the finished product. Please telephone us at (415) 331-7849 for further information on our premium French oak and the various wine tank and barrel infusion systems we've designed to compliment it.

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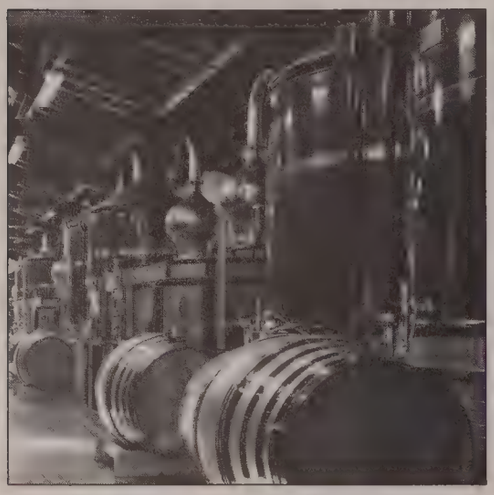
Or please write us at: StaVin Incorporated, Post Office Box 1693, Sausalito, California 94966 U.S.A.

equipment to 30 tons per hour from Zambelli and CEP and now represents



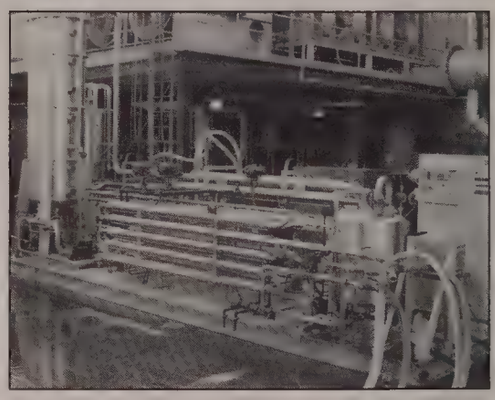
Prulho distillation equipment from Cognac and Dabreigeon membrane presses in sizes from 16 to 230 hectoliters.

TCW also represents Schenk Filter Systems of Germany, which makes lees filters (470-mm to 2,000-mm plates) and sheet and DE filters.

Supplies include TriClamp and I-line stainless steel fittings, Flo-coupling fittings, winery hose and banding equipment. Butterfly, bypass, ball, pressure relief, and sample valves are in stock. Custom fittings fabricated by TCW include reducers and connectors for equipment with different fitting and end sizes. Leica refractometers, ebulliometers, temperature controllers, hydrometers, pH meters, and fermentation locks and stoppers are in stock. Other items made or handled are custom sight glasses, barrel mixers, topping guns, stainless steel racking tubes, barrel washers, tank-gauging equipment, sparging devices, and gauges.

A catalogue is available. The Compleat Winemaker is located one mile south of downtown St. Helena.

For more information, contact: Bob Ellsworth, Bill Bartolucci, or Wayne Burgstatler, **The Compleat Winemaker**, 955 Vintage Ave., St. Helena, CA 94574, tel: 707/963-9681, fax: 707-963-7739. **Please see our ad, page 56.**



CONETECH, INC.

Both marketed and operated by ConeTech, the Spinning Cone Column (SCC) is unique technology from Australia whose low temperature vacuum operation provides the winemaker with a new range of options. These include *alcohol management, desulfiting, flavor recovery* from waste, and *off-odor removal.*

The SCC is now in extensive use for downward adjustment of high alcohol wines, often unmasking greater flavor complexity. One specific benefit is the feasibility of full grape ripeness and flavor development at harvest, without the consequent disadvantage of high alcohol.

Key to the dealcoholization process is the prior capture at low temperature of all the wine's delicate volatile aroma compounds which are later re-incorporated. This avoids the destruction of flavor by heat or loss through a membrane along with the alcohol, as occurs with other methods. The same principles apply to the production of reduced alcohol or dealcoholized wines with full integrity of aroma/flavor.

Desulfiting with the SCC (to as low as 5 ppm or less) brings two benefits: *year-round winemaking,* whereby grape juice can be stored under high SO_2 at ambient temperature until required for winemaking or as muté; and *red grape extraction,* whereby lightly extracted, fruity aromatic reds, and even extended low temperature barrel fermentation, are made possible.

ConeTech provides Spinning Cone Column services to the wine industry at two locations: Delicato Vineyards in Manteca, CA, and The Associated Vintage Group in Hopland, CA. *For more information, contact:* **ConeTech, Inc.**, 340-21 El Camino Real South, Salinas, CA 93901, tel: 408/755-0805, fax: 408/753-1006.

CRIVELLER COMPANY

In collaboration with one of the largest European manufacturers, Criveller Company proudly presents the ultimate design in red grape fermentation: the Rotofermenter. This unit, already successfully marketed in North America, is

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Replacing your wooden bungs this year? Fabricated from high grade silicone, the Boswell bung easily outperforms its fir and redwood ancestors. The Boswell bung puts a stop to wicking and requires no pretreatment. Easy to place and remove, the Boswell bung provides extra protection for your valuable barrels. The Boswell bung. Cost efficient. Pure and simple.

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entirely built in stainless steel and may range in size from 80-HL (2,100-gal) to 600-HL (15,900-gal).

The Rotofermenter offers the exceptional advantages of controlling fermentation temperature, extracting more color, operating as a dejuicing tank, and facilitating the handling of the fermented dregs prior to pressing.

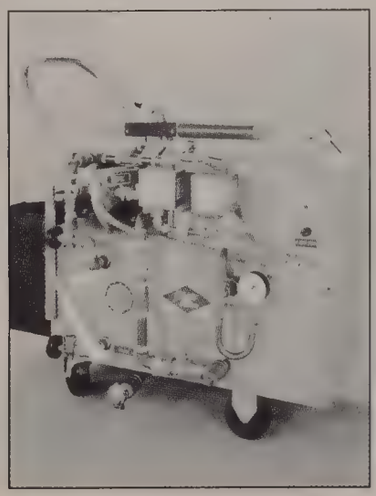
Rotofermenters may also be used to cryomacerate aromatic varieties such as Gewurztraminer which will greatly assist in achievement of a deeper flavor extraction.

For more information, please contact: **Criveller Company** at 905/357-2930 or 905/358-5202 or by fax to: 905/374-2930 for additional information and reference contacts.

Please see our ad, page 11.

ELECTRO-STEAM GENERATOR

All-electric steam generators for cleaning and sanitizing work areas and winery equipment such as vats, bottling lines, and crushers. Electro-Steam hand-built generators are portable and come in sizes from ½ to 54 BPH (boiler horsepower). They require no boiler chemi-



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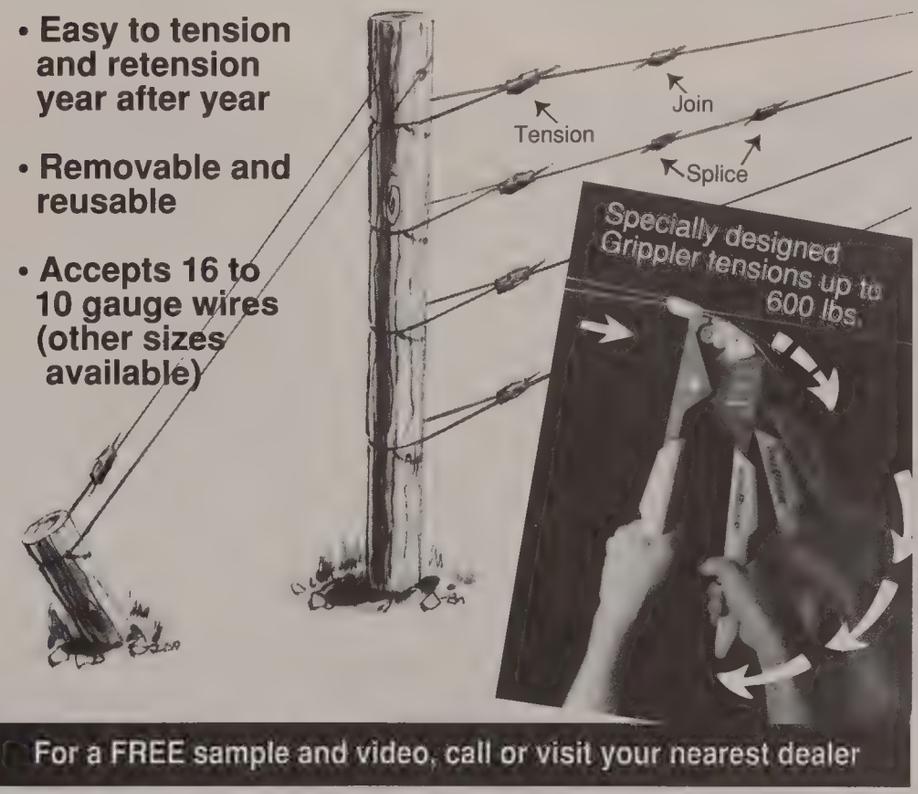

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cals and operate at 96% efficiency.

For more information, contact: **Electro-Steam Generator**, 1000 Bernard St., Alexandria, VA 22314, tel: 800/634-8177 or 703/549-0664, fax: 703/836-2581.
See our ad on page 11.

ENOTECH CORPORATION

ENOTECH offers a complete line of capsuling equipment, including special-design **capsule spinners** specifically suited for tin and polylaminate capsules; **capsule applicators** for all types of wine and champagne capsules; and **heat-shrink equipment** for any bottling line speed up to 350 BPM.

Heat-shrink equipment includes **rotary machines** with individually heated, multiple thermal heads, as well as various length **shrink tunnels** with tilt/lift adjustment. These tunnels do not exhaust heat onto the bottle conveyor, which allows the use of an optional bottle-rotating device. Spinners and rotary heat-shrinkers can be combined with capsule applicators into monobloc units.

A universal monobloc capsuling machine combines a capsule applicator and spinning heads (for tin and polylam capsules), with thermal heads (for heat-shrink capsules). Heads need not be removed/re-installed when changing from one capsule type to another. This universal machine is space-saving, particularly convenient to use, and cost-effective when running a variety of different bottles and capsules on the same bottling line.

For more information, contact: **ENOTECH Corporation**, PO Box 576, Palo Alto, CA 94302, tel: 415/851-2040, fax: 415/851-2034.

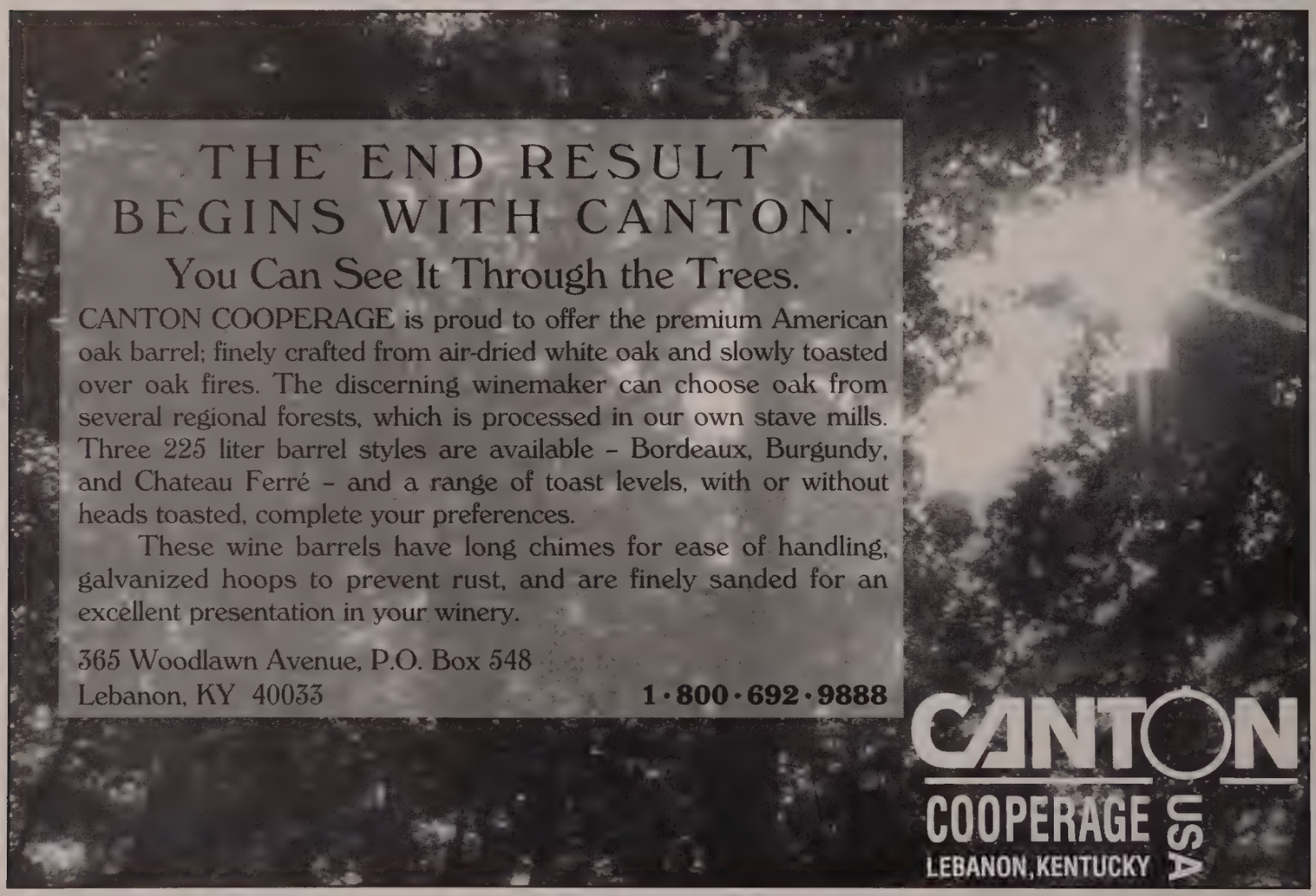
EURO-MACHINES, INC.

New for 1995 is the addition of an office and warehouse in San Jose, CA, to better serve Europress customers on the West Coast. Also, 1995 marks Euro-Machines' 10-year Anniversary of serving customers on the East Coast from its Culpeper, VA, location.

Euro-Machines is a subsidiary of Scharfenberger Company in Germany, manufacturer of the Europress Grape Press, and as such, is the **only** press manufacturer to represent itself in North America.

The Europresses are designed individually to every size winery and range in capacity from 380-L to 25,000-L, constructed completely of stainless steel. The very heart of the Europress is its freely programmable, fully automatic digital control with individual settings of juicing, draining, and crumbling time, and inflation-pressure setting of 0.2- to 2-bar with settings for multiple repeats.

Advantages of the Europress are many: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BEGINS WITH CANTON.
You Can See It Through the Trees.
CANTON COOPERAGE is proud to offer the premium American oak barrel; finely crafted from air-dried white oak and slowly toasted over oak fires. The discerning winemaker can choose oak from several regional forests, which is processed in our own stave mills. Three 225 liter barrel styles are available - Bordeaux, Burgundy, and Chateau Ferré - and a range of toast levels, with or without heads toasted, complete your preferences.
These wine barrels have long chimes for ease of handling, galvanized hoops to prevent rust, and are finely sanded for an excellent presentation in your winery.
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1) the largest door opening available; 2) unrestricted full capacity drum (ideal for whole cluster pressing); 3) draining area encompassing 50% of the drum circumference; 4) 4-inch, 5-inch, or 6-inch axial inlet with a ball valve; 5) extremely low rotational speed of 1.5 RPM with axial feed and pulse timer (ideal for crushed grape pressing with the highest possible pre-juicing and greatest capacity).

For more information, contact:

Euro-Machines, Inc. - EAST, PO Box 843, Culpeper, VA 22701, tel: 703/825-5700, fax: 703/825-5789.

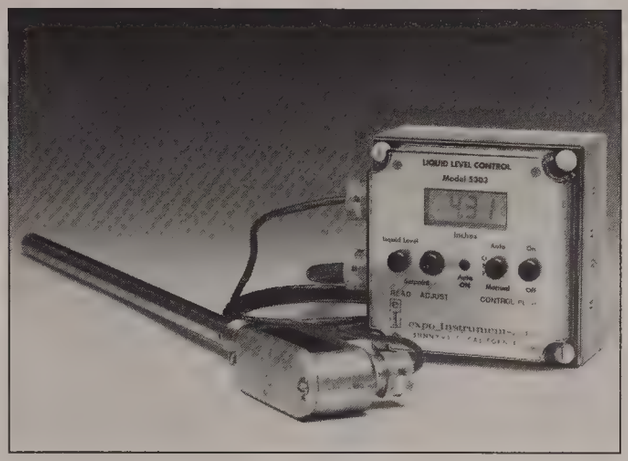
Euro-Machines, Inc. - WEST, 1968 Hartog Dr., San Jose, CA 95131, tel: 408/452-7600, fax: 408/452-7689.

Carlson Equipment Co., 5228 Aero Dr., Santa Rosa, CA 95403, tel: 707/576-0632, fax: 707/576-7698.

Please see our ads, pages 9, 35, 45.

EXPO INSTRUMENTS, INC.

Designed for single tanks or small tank farms, the Model #5303 from Expo Instruments is a simplified version of



Expo's multi-tank, centralized liquid-level monitor. The #5303 uses new state-of-the-art circuitry and is the answer to virtually any application requiring the measurement of liquid levels in a single tank or any number of tanks.

The Model #5303 is a low-cost, solid-state (no relays) individual tank system that is accurate, easy to install, reliable, simple, and weather-resistant. Since this is an individual tank system, wiring and installation are greatly simplified, reducing the cost per tank.

The system consists of a probe, probe head, control unit, and cable to connect the probe head to the control unit. It includes a digital readout, solid state switch for either control or alarm, weather-proof function switches and calibration controls. The system can be installed in any size tank.

The #5303 offers a continuous readout with an accuracy of better than 0.1 inch with a juice or wine.

Many options are available, such as expanded tank height, temperature measurement, and a variety of control configurations, including transmitters compatible with PLCs and computer monitor systems.

Expo Instruments has served the wine industry for 25 years, specializing strictly in liquid level measuring and control. All equipment is designed in-

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We salute the California Wine Industry for increasing sales in the export wine market!

At Joseph W. Ciatti Company, we're proud to be a part of the California wine industry's explosion into the world wine market. In 1993, we shared in this success with record sales to Canada, Sweden, Europe and the Far East. We stand ready to make 1994 an even more successful year by providing you with a full array of wine brokerage services, including:

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house and manufactured in Sunnyvale, CA. With this background and experience, Expo can provide you the best and least expensive system available.

For more information, contact: **Expo Instruments, Inc.,** 989 E. California St. #4, Sunnyvale, CA 94086, tel/fax: 408/245-8822.

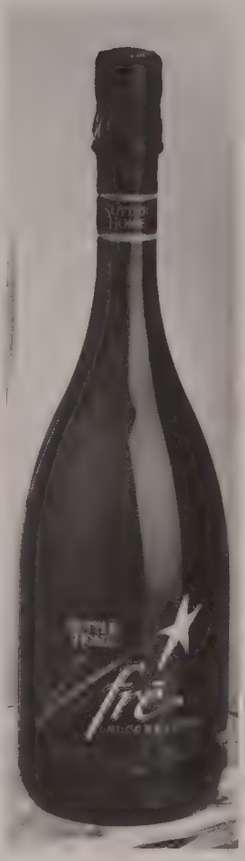
FP PACKAGING, INC.

fp Packaging, Inc., offers a complete range of winery processing and bottling equipment from manufacturers known worldwide for quality, technology, and service.

Diemme's AR-series tank presses are available in 1,800L, 3,000L, 5,000L, 8,000L, 15,000L, 26,000L, and 32,000L capacities; all feature state-of-the-art PLC controls for flexibility and reliability. The smaller, 1,800L to 8,000L, models are built entirely in stainless steel, including frame, and may be ordered with or without optional compressor systems.

All Diemme AR presses include axial feed systems as standard equipment. Optional on 5,000L and larger presses is Diemme's "Intelligent Program," a self-programming feedback-based control system which constantly monitors and adjusts the press cycle to maximize yield and quality.

Cavagnino & Gatti has been successful with its combination pressure-sensitive/wet-glue labeler recently installed at Sutter Home Winery (St. Helena, CA). Utilized on Sutter Home's new "fré" sparkling brut, this four-station labeler applies clear pressure-sensitive film labels front and back while wet-glue applying an aluminum foil over the wire hood and neck band at speeds exceeding 140 bottles/minute (see photo).



A new generation of capsule spinning heads is available from Robino & Galandrino. These heads allow for perfect spinning. They are available on the Fenix or Astra model capsule dispensers/applicators.

In addition to Diemme and Robino & Galandrino, fp Packaging's equipment range includes: Cobert fillers; Bertolaso corkers, spinners, cappers and conveyors; Cavagnino & Gatti wet-glue and pressure-sensitive rotary labelers; Berchi case packers; Padovan filtration equipment; and supplies including **fp Portocork** cork, PVC, polylaminated and tin capsules, and Chalufour French cooperage.

For more information, contact: **fp Packaging, Inc.,** 601 Airpark Rd., Napa, CA 94558, tel: 707/258-3940, fax: 707/258-3949.

Please see our ad, page 2.

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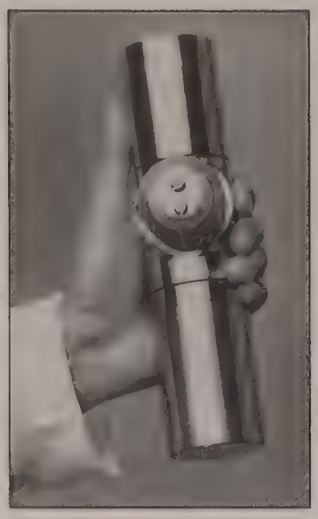
GAMAJET CLEANING SYSTEMS INC.



The new Gamajet® V tank-cleaning machine from Gamajet Cleaning Systems, Inc., provides fast, low-cost cleaning of tanks with three-inch access openings. It meets the needs of many industries in an era when smaller batches and quick turnaround are becoming increasingly important.

Featuring the same durable construction, simplicity of design, and performance of the standard Gamajet IV, the new Gamajet V has been field-tested and exceeded performance expectations in applications involving chemicals, coatings, tote tanks, and tank trucks.

Gamajet V's precision jet-washing patterns deliver outstanding washing efficiency at low and medium pressures and volumes. It operates at ranges of 100-600 psi and 5-30 gpm. Jet impact force at 10 feet, for example, is approximately 29 lbs/sq.ft. with pump pressure of 200 psi.

The unit weighs just seven pounds and measures less than nine inches in length. Fluid-driven with no external motor, its ease of use gives operators an extra margin of handling comfort and safety.

Gamajet V easily passes through a three-inch opening, eliminating the common problem of insufficient clearance. No disassembly or adjustment are required. Configured with dual nozzles for full 360° washing coverage and a range of nozzle sizes (0.110 to 0.200-inch).

Featuring a high reduction ratio gear system, a sealed planetary gearbox eliminates any possibility of contamination of wash fluid by lubricants. Gamajet V provides the level of performance required for wineries facing environmental requirements related to waste, toxicity, and efficient treatment of effluents.

For more information, contact: **Gamajet Cleaning Systems Inc.**, 2421 Yellow Springs Rd.-Bldg. One, Malvern, PA 19355, tel: 800/BUY-JETS (800/289-5387).

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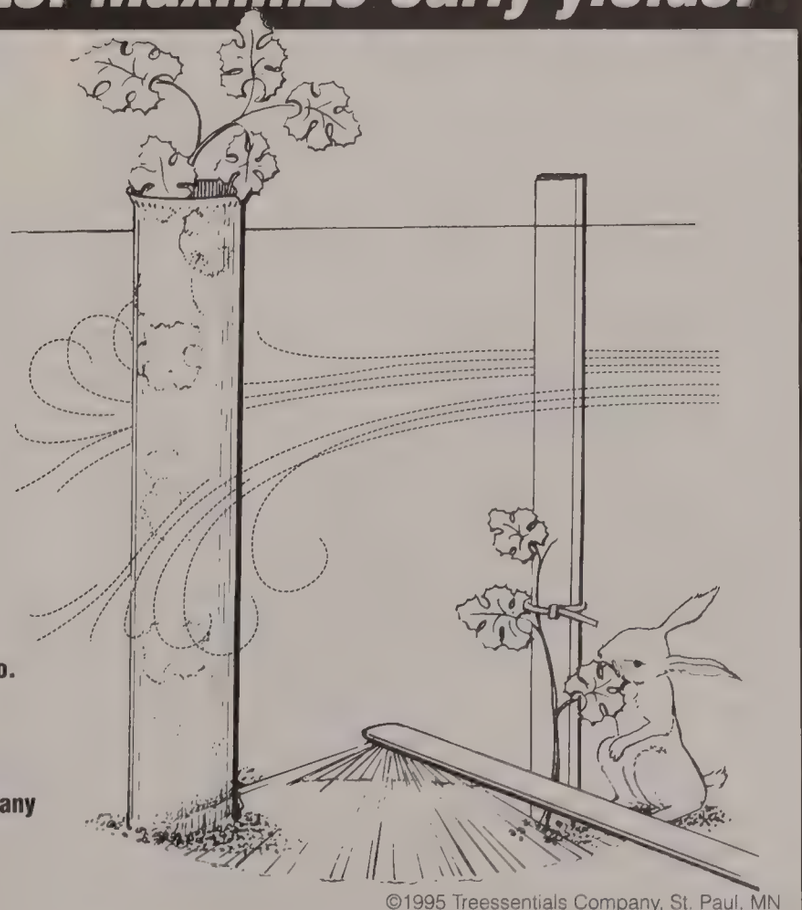

For a FREE brochure and technical update, call or write the Supertube VTS dealer nearest you:

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1-800-544-2210

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Fresno, CA 93725
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design team to ensure the project is coordinated and stays on schedule. Start-up and maintenance programs ensure peak performance, while preventive maintenance plans are geared to avoiding problems before they occur.

Westec Winery Equipment has supplied the winemaking industry for more than a decade. The company not only provides quality, innovative equipment but works with each winery customer to custom-fabricate products to fit specific needs.

The list of high-quality stainless steel products available from Westec is long. Pumps, hose, custom tools, sight glasses, and custom fittings are just the tip of the iceberg. Westec can also design, fabricate, and install catwalks, hoppers, conveyors, must lines, and tank stands.

The Belt Conveyor is Westec's latest innovation. It allows for whole-cluster processing which results in much less handling and maceration of grapes.

Look to Westec for solutions to all of your winemaking challenges.

Westec Tank Company has quickly become a leader in stainless steel tanks, ranging from wine to brew, and even pharmaceutical.

Whether you need a standard tank or one that's custom-built to precise specifications, Westec Tank strives to achieve 100% customer satisfaction.

For high-quality tanks at the most competitive prices, choose Westec Tank.

For more information, contact: **IRAPP, Westec, Westec Tank**, P.O. Box 129, Healdsburg, CA 95448, tel: 707/433-9471, fax: 707/433-1310.

Please see our ad, page 47.

KLR MACHINES, INC.

KLR Machines supplies Vaslin and Bucher grape processing equipment, including the Delta destemmer/crusher, PM progressive cavity must pumps, Vinimatic rotary fermentors and drainers, and a wide range of presses.

The Vaslin line includes the smaller PHP and larger CEP horizontal basket presses for red wines. The Bucher line includes the smaller (1,500 - 5,000 liter) Bucher RPF presses and the larger (8,000 - 32,000 liter) Bucher RPZ and RPA presses.

The Bucher RPF press includes enhanced programming functions and replaces the Bucher RPS line of small presses. The Bucher RPA press extends these capabilities to the larger press sizes.

KLR also provides Begerow and Romicon filtration media and equipment, including BECO filter sheets and Becofloc filter aid. Crossflow filtration equipment from Romicon includes both the Romicon WF wine filter and Romicon LF lees filter.

Other supplies and equipment from KLR include Sanoplast heat-shrink capsules, and Unipektin dealcoholizers, desulphurizers, evaporators, essence recovery units, and specialty heat exchange equipment.

KLR celebrated its 10-year anniversary in 1994 and maintains sales and service offices in Sebastopol, CA, and Bath, NY.

For more information, contact: Ivan Linderman, Steve Valeriote, or Al Dunkelberger, **KLR Machines**, 350 Morris St., Suite E, Sebastopol, CA 94572, tel: 707/

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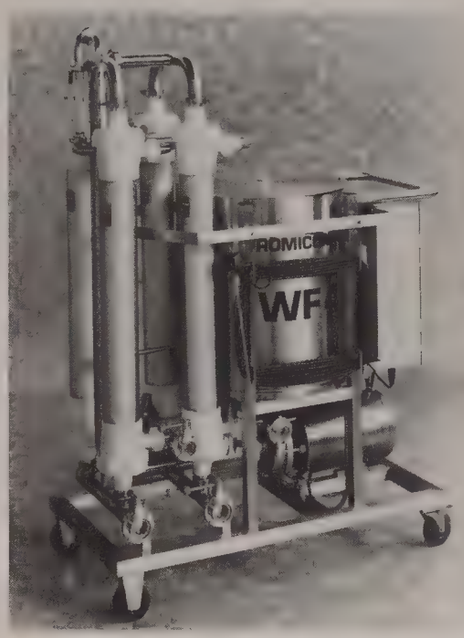
823-2883; fax: 707/823-6954. *In New York, contact*: Jurgen Koch or Dave Reagan, 47 West Steuben St., Bath, NY 14810, tel: 607/776-4193; fax: 607/776-9044.
Please see our ad, page 43.

KOCH MEMBRANE SYSTEMS, INC.

Koch Membrane Systems offers the Winefilter™, a compact, mobile, and automatic filtration system which utilizes Romicon® hollow fiber membrane cartridges.

Wine is clarified in one step, with only minimal supervision. More than 300 units are installed worldwide filtering wine and grape juice without the need for DE or pad filtration.

The unique Romicon microporous membrane removes bacteria and yeast while allowing flavor components and color to pass through. The Winefilter™ technology can be employed for simple clarification, stopped fermentation, and must filtration. Fining agents, such as bentonite and carbon, may be used and will not affect system performance.



A newly developed hollow fiber cartridge, the Leesfilter™, can process lees to high recovery in one step without the adverse effects of vacuum filters. This allows reuse of the entire product for blending.

Winefilter units are available in capacities ranging from 75 to 3,000-gal/hour. The model WF-4 (see photo) can filter up to 400 gal/hour of wine or 100 gal/hour of lees.

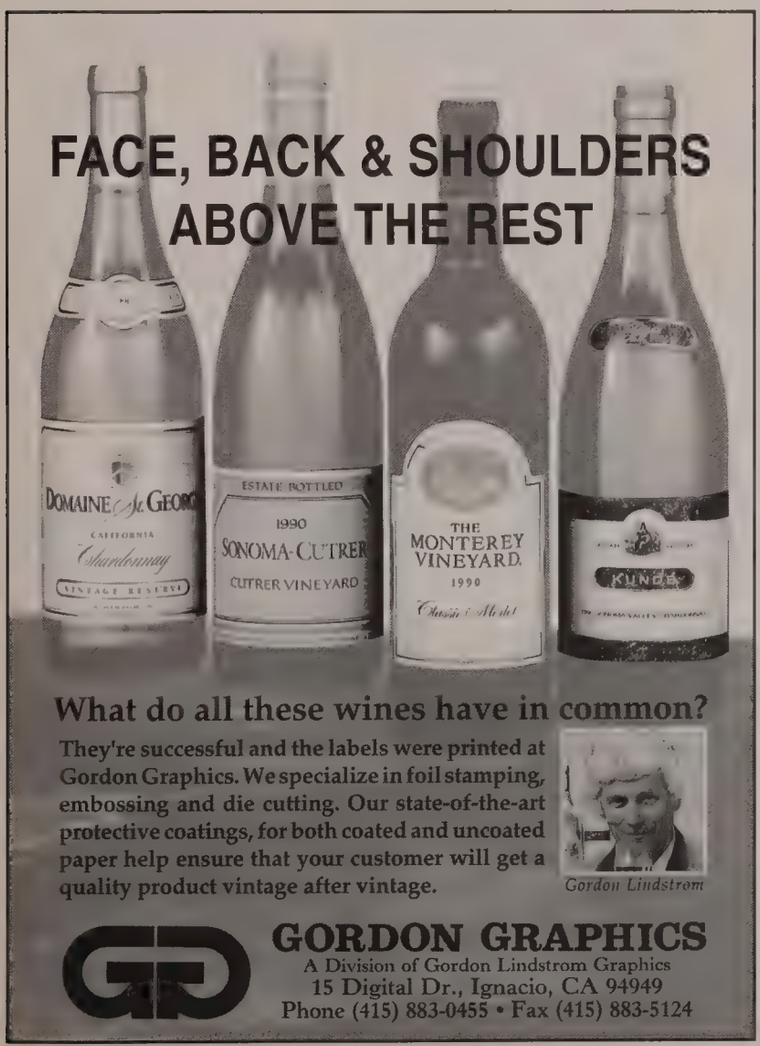
The regenerable Winefilter and Leesfilter™ cartridges are easily cleaned with simple backflushing and chemical recirculation and typically last for three years or more.

For further information or a demonstration, contact our exclusive North American agent, **KLR Machines** in Sebastopol, CA, 707/823-2883, or Bath, NY, 607/776-4193. **Koch Membrane Systems** can be contacted directly at tel: 508/657-4250 or fax: 508/657-7349.

MCBRADY ENGINEERING

McBrady Engineering's new Orbit Steam Rinser, Models #200s and 220s, uses steam followed by gas injection. The steam rinse produces a more sterile bottle immediately before filling than other rinsing systems do.

Orbit bottle cleaners, rinsers, and gas injectors are available in the fol-



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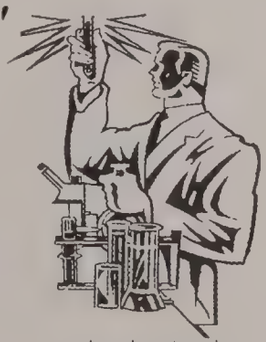
"We have the answer !"

Include 4-ethylphenol analysis in your microbiology program to improve early Brettanomyces detection and control of established populations. Brettanomyces produces 4-ethylphenol in direct proportion to the population present. ***Please request our current bulletins for more information !***



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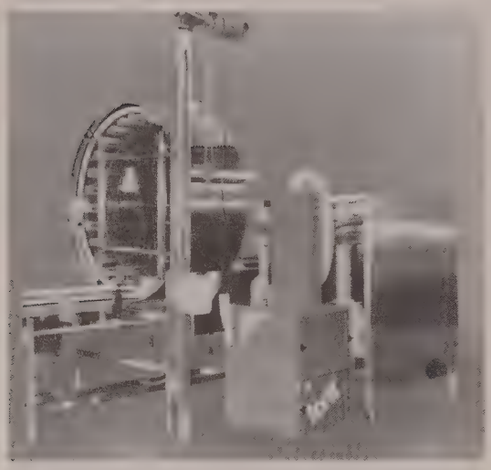
E T S Laboratories provides a complete spectrum of analytical services to the beverage industries. We are committed to assist our clients with an unmatched level of reliability, objectivity, and confidentiality.



lowing models:

Model #220 — Features a duplex rotor design that handles two bottles per rotor pocket for twice the cleaning and gas injection time. Speeds up to 250 bpm.

Model #200 — Standard model. Speeds up to 150 bpm.

Model #100 — Standard model. Speeds up to 90-100 bpm.

Model #60 — Economy model. Speeds up to 60-70 bpm.

Model #40 — Super economy model. Speeds up to 40-50 bpm.

For more information, contact: **McBrady Engineering, Inc.**, P.O. Box 2549, Joliet, IL 60436, tel: 815/744-8900, fax: 815/744-8901.

Please see our ad, page 53.

MEE INDUSTRIES INC.

Good humidification benefits winemakers by reducing loss due to evaporation. Mee Industries makes humidification devices for a variety of manufacturing processes.

A high-pressure water-atomizing system, the **Mee Fog System** creates droplets about 1/10 the diameter of a human hair (in the 10 micron range). The fog droplets are so small they remain suspended until they fully evaporate, helping to maintain a humid, cave-like atmosphere in the cellar.

Mee Fog is energy-efficient. Engineers at Mee Industries passed by existing technologies which require boilers for steam or air compressors to operate air-water nozzles. Instead, the Mee Fog system pre-filters tap water at the control station where it is pressurized to 1,000 PSI and released into a network of distribution tubing to the Fog Nozzles.

In the overhead Fog Nozzles, water is forced through a .006-inch diameter hole, producing a jet of water. The jet hits a specially tuned pin that atomizes it into a plume of mist that's nearly three feet long. The care put into treatment of the water and the impervious 316 stainless steel nozzle body mean clogging and corrosion are rarely a problem.

Automatically controlled by a humidistat, the Mee Fog system reacts to and

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corrects changes in humidity caused by open doors or air conditioning.

For more information, contact: Randy Foote, Agricultural Division Sales Manager, **Mee Industries Inc.**, 4443 N. Rowland Ave., El Monte, CA 91731, tel: 800/REAL FOG, 818/350-4180; fax: 818/350-4196.

MOBILE WINE LINE

Mobile Wine Line, a mobile bottling service operating since 1978, offers a significant advantage to smaller wineries that produce anywhere from 800 to 25,000 cases of wine per year. By using this mobile service, wineries avoid the expenses of purchasing and maintaining equipment that may be used only two or three times each year.

Situated in a self-contained tractor-trailer, Mobile Wine Line's equipment consists of a custom loading table, a McBrady Orbit bottle sparger, a Seitz Fulla 12-spout vacuum filler/corker, an Otto Sick automatic polylaminate/tin foil spinner, an Afseal heat-shrink tunnel, a Mustang II New

Jersey Machine glue labeler, a Labelaire pressure-sensitive back labeler, a custom five-foot secondary label press, and a 3M Scotch tape case sealer/printer.

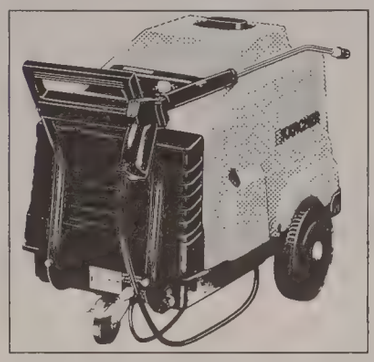
The line speed is adjustable, since a quality finished product is their goal.

"Mobile Wine Line is the lowest priced bottling service, and our quality is backed by our experience. Let us do your estate bottling for you!"

For more information, contact: **Mobile Wine Line**, 9601 Robson Rd., Galt, CA 95632, tel: 209/745-2871.

NAPA FERMENTATION SUPPLIES

Napa Fermentation Supplies offers a full line of winemaking equipment and supplies, including: Kärcher pressure washers, Jabsco pumps, Zambelli crushers and presses, G&H stainless steel fittings, Refractometers (Atago, ATC1), glass wine thieves, Zambelli must pumps, Zambelli eight-inch plate and frame filters, and Schaefer labelers.



For more information, contact: **Napa Fermentation Supplies**, 575 Third St., Bldg A, Napa, CA 94559, tel: 707/255-6372, fax: 707/255-6462.

Please see our ad page. 42.

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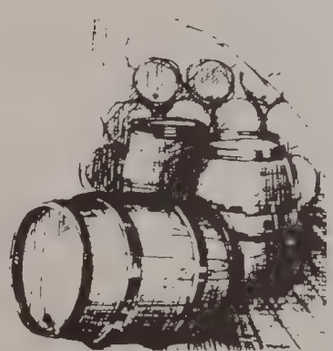

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PECHINEY CORK & SEAL OF CALIFORNIA

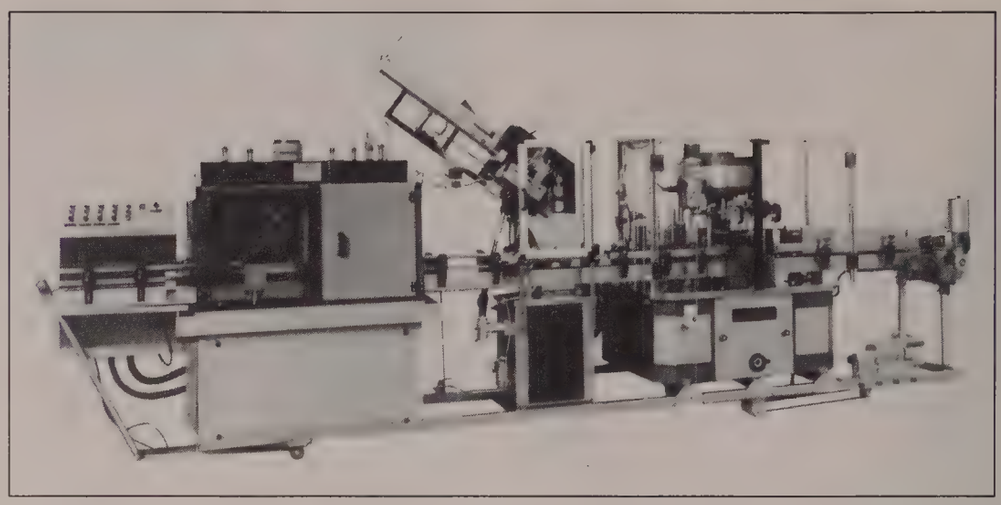
Pechiney Cork & Seal of California (PCSC) provides a full product line of equipment for *sparkling wines* (from press to case packer), as well as a complete range of chemicals for still and sparkling wines.

In order to improve its service, PCSC now introduces a new line of equipment for *still wines*. PCSC's new supplier, Cames, conceives and integrates its own fabrications (bottle washer) and other selected machinery to offer comprehensive "Monobloc" equipment — multi-task machines with a common drive — or individual machines (capsule dispenser, capsule spinner, labeler).

Those machines can be set up for all kinds of capsules (heat-shrink, polylam, tin, and aluminum) at any speed (up to 250 bpm).

The PCSC team has been selling, installing, and maintaining wine equipment for more than 11 years in the U.S.

The company's product line includes: Cames "Monobloc" (bottle washer/capsule dispenser/spinner/labeler); Valentin (biduler-crown capper, disgorger, corker-wirehooder, agitator); TDD (small filler, disgorger-doser); Champagel (neck freezer); Perrier (bottle rinser, disgorger-doser); Thierion (conveyor, bottle manipulator); Kosme (labeling); Oeno-Concept (membrane press, tartaric stabilization, automatic riddling); Leban; Taillet (riddling rack); Cermex (case packer).



PCSC's extensive line of wine-related chemicals includes: Station Oeno-technique de Champagne-Martin Vialatte; Institut Oenologique de Champagne; and Oeno-France.

For more information, contact: sales: Mathias Mélan-Moutet, technical: Joe Mironicki, **Pechiney Cork & Seal of California**, 5425 Napa-Vallejo Hiway, American Canyon, CA 94589, tel: 707/257-6481, fax: 707/257-8028.

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ALTERNATIVE WINEGRAPE VARIETIES SYMPOSIUM • JULY 19-20, 1995

OMNI HOTEL, CHARLOTTESVILLE, VIRGINIA

The Eastern Section of the American Society for Enology and Viticulture is sponsoring a two day symposium in conjunction with the 1995 annual ASEV/ES meeting in Charlottesville, Virginia.

The Symposium Alternative Winegrape Varieties theme is intended to draw attention to novel winegrape varieties that have developed special consumer niches or have regional importance because of disease resistance, cold hardiness, or other attributes. Sessions, with tastings, on growing, cellaring, and marketing varieties including Viognier, Norton, Sangiovese, Malvasia, and others, will be presented by national and international speakers.

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PROSPERO EQUIPMENT CORP.

Prospero Equipment is introducing a wine press and two new lines of machines to the North American market in 1995. The sensation at the recent SEMEI show in Milan, Italy, was the new Della Toffola model PF membrane press. This press combines the advantages of the bladder press and the membrane in one ingenious design. In 1994, Della Toffola delivered more than 250 PF presses to the European wine industry.

This innovative press is completely built of stainless steel and has a computerized controller that is very simple to program. It is built in sizes from 8HL to 200HL.

Prospero is now the North American representative for Cortellazzi filling machines and Comac automatic kegging systems for wine. Cortellazzi specializes in counter-pressure fillers for sparkling wine, beer, mineral water, and juices. They build machines from 24 to 120 spouts in monoblock design, complete with rinser and closure machine.

Comac offers a complete modular system for filling standard bar kegs with still wine or beer for bulk dispensing. These machines automatically completely wash and sanitize the interior of the keg and then refill it with your wine. The modular design allows production speed to be increased simply by adding more sections to the machine.

For more information, contact: **Prospero Equipment Corporation**, 134 Marble Ave., Pleasantville, NY 10570, tel: 800/332-2219, or in California, **AWS**, 7714 Bell Rd., Windsor, CA 95492, tel: 800/228-0664.

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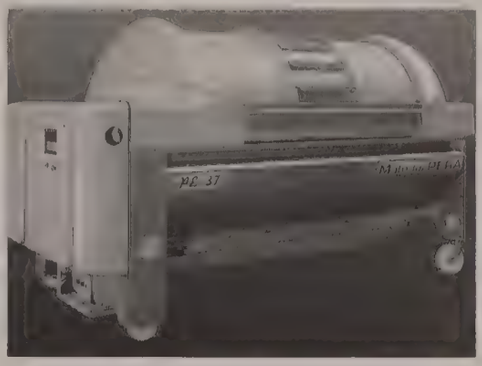
Amos and Kiesel progressive cavity pumps are available in five to 100 tph capacity. All models have reversal protection switches, dry run protection, and are ideal for transferring must, fermented must, or whole clusters.

Strassburger manufactures pad, DE, lees, and cross-flow filtration systems. The MicroCross cross-flow filter provides sterile filtration in only one pass with no color stripping.

Pera presses come in two models: the PE with a slotted stainless drum, and the PN with a totally enclosed stainless



drum. Both are available with a variety of options, including double doors for direct loading of whole clusters and a flexible PLC controller.

The Willmes tank and universal presses are also available with a variety of options, including a PLC controller with champagne or still wine programs. The newest WCP press is designed specifically for use in the small to mid-sized winery.

For more information, contact: **RLS Equipment Co.,** tel: 609/965-0074 or 800/527-0197 on the West Coast. **Please see our ad, page 62.**

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Santa Rosa Stainless Steel (SRSS) has built and installed more than 12,000 tanks in over 500 wineries and elsewhere across the U.S. in the last 25 years. The company manufactures a variety of tanks including: fermenting, storage, and dejuicing tanks as well as dosage and charmat tanks for champagne.

Tank capacities range from one gallon to 230,000 gallons. Cooling jackets with a variety of designs are also available, including channel design and low or high-pressure jackets for glycol, ammonia, or freon.

SRSS has designed, fabricated, and installed several 50-bbl brew houses and fermenting cellars, including a steam-fired kettle, mashtun, and lautering system.

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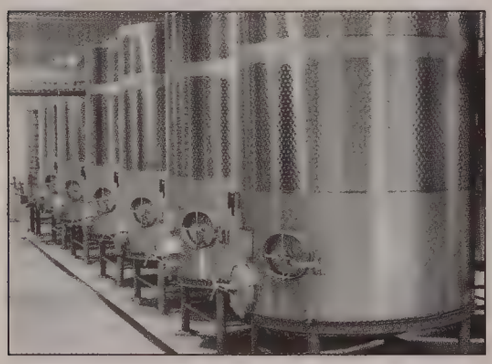
3,000, and 4,500-gal. stock tanks for immediate delivery and also manufactures aluminum catwalks, sumps, press pans, and many other items in stainless steel.



With extensive experience delivering tanks outside the United States, SRSS has shipped tanks to the Orient, South America, Mexico, and Australia.

SRSS continues to manufacture quality stainless steel tanks for the wine industry at competitive prices.

For further information, contact: **Santa Rosa Stainless Steel,** 1400 Airport Blvd., Santa Rosa, CA 95403, tel: 707/544-7777. **Please see our ad, page 52.**

SCOTT LABORATORIES

Velo SpA offers a wide range of grape and wine processing equipment. Scott Laboratories first introduced Velo into the North American market in 1980. Now, 15 years later, there are more than 550 machine installations.

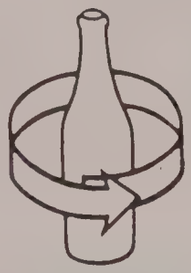
In recent years, Velo has invested significant R&D efforts in the area of flotation separation. There are now more than 90 installations worldwide. This revolutionary technology involves clarification by rapid flotation and removal of solids from must to improve quality and reduce the need for settling tanks. Available systems process 2,000 to 13,000 gal/hour. Smaller systems are now in the design and testing phase.

Scott Laboratories offers a wide variety of other Velo equipment including pneumatic presses and rotary fermenters plus pressure leaf, rotary drum, lees, and plate filters.

Rauch destemmer/crushers are available from Scott with a range of 9-22 tons/hour. These German machines are highly adjustable to individual needs. All models may be supplied with or without progressive cavity pumps.

In 1993, Willmes GmbH began field testing of its new "Progress Press." Distribution began in Europe in 1994, and the press will be available for the first

time in North America in 1995. The "Progress Press" incorporates three large cylindrical drainage receptacles mounted perpendicular to the interior of the tank. This unique design provides radically improved drainage and processing. When these facts are considered together with an economical price, the



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revolutionary character of the press is unmistakable.

For more information, contact: **Scott Laboratories, Inc.**, 2220 Pine View Way, Petaluma, CA 94955, tel: 707/756-6666, fax: 707/765-6674; or **Scott Laboratories, Ltd.**, 1845 Sandstone Manor, Unit #14, Pickering, ONT. L1W 3X9 Canada tel: 905/839-9463, fax: 905/839-0738.
Please see our ad, pages 38, 47.

WESTERN SQUARE INDUSTRIES, INC.

Western Square Industries has manufactured portable wine barrel racks, grape harvesting bins, and steel trailers for wineries and grapegrowers in the U.S. and overseas since 1985.

Western Square has designed a new trailer for the "valley system," which fits easily into narrow vineyard rows. "We sold more of these trailers in this last season than of our standard trailers," says Trygve Mikkelsen, vice president of marketing. "This year, the narrow trailer has a ramp, perfect for unloading half-ton or two-ton bins to the ground.

The trailer also has small stepping boards on the back and front, for minimum turning radius and easy access to the two-ton bin."

John Lansingh, Western Square's sales representative in Napa, adds, "With the new ramps, the tractor driver can unload even two-ton bins without a forklift. No forklift is necessary until you are lifting the full bin onto the truck bed."

"We also offer a unique solution for vineyards with rows so narrow trailers and tractors can't get through," says Mikkelsen. "Vineyard managers approached us to manufacture a lightweight hand-trailer for the individual picker using small rectangular plastic containers.

"Another new product for the sparkling-wine producer is our F.Y.B. trailer. This trailer is low to the ground, 50 inches wide, and designed for a small turning radius." Mikkelsen explains, "Specifically designed at one large customer's request, this unusual trailer is perfect for the vineyard manager who needs to transport F.Y.B. bins directly to the winery."

For more information, contact: **Western Square Industries**, Inc. tel: 800/367-8383 or 209/944-0921.

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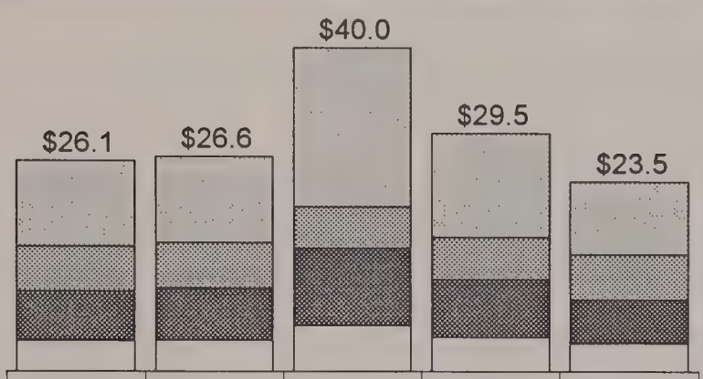
Costs of vineyard development and operation

by Mike Fisher,
Motto, Kryla & Fisher

In the past ten years, there have been major changes in vineyard technology, which have not only enhanced the quality of wine grapes but also increased the efficiency of the grapevine, allowing greater yield per acre. Many growers have abandoned the traditional spacing and trellis system of the 1960s and 1970s commonly known as the "California sprawl" and planted vines closer together with more sophisticated trellis systems to better match the growing conditions of a specific site.

As a consequence of this diversity, the cost to develop new vineyards has

Vineyard Establishment Costs
Total per acre ($000's) through Year 3



	GDC 11x6	Lyre 11x6	Vertical 6x4	Vertical 8x6	Traditional 11x7
Basic Development	$10.6	$10.7	$19.6	$12.9	$9.0
Site Spec Development	$5.6	$5.6	$5.2	$5.2	$5.6
Operating	$6.1	$6.4	$9.5	$7.1	$5.4
Financing	$3.8	$3.9	$5.7	$4.3	$3.5

Annual Vineyard Operating Costs per Acre

	GDC 11x6	*Lyre 11x6*	*Vertical 6x4*	*Vertical 8x6*	*Traditional 11x7*
COSTS:					
Operating					
Farming	$ 1,611	$ 1,766	$ 2,786	$ 1,968	$ 1,422
Harvest	840	840	960	720	600
Overhead	997	997	1,183	1,016	981
Operating	3,448	3,603	4,929	3,704	3,003
Depreciation	1,301	1,315	1,907	1,438	1,167
Interest	2,002	2,059	3,484	2,453	2,072
Annual Costs	$ 6,751	$ 6,977	$ 10,320	$ 7,595	$ 6,242
Estimated tons	7	7	8	6	5
Cost per ton	$ 964	$ 997	$ 1,290	$ 1,266	$ 1,248

Charts furnished by Motto, Kryla & Fisher

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become more difficult to estimate. Depending on the source, estimates range from $5,000 to $30,000 per acre. There are two major reasons for this wide difference: first, which costs are included in the estimate, and second, what costs are incurred because of specific site requirements.

Because of the wide variations in costs, Motto, Kryla & Fisher has compiled a *Vineyard Cost Study* based on the costs experienced by growers in the North Coast of California to establish and operate a 30-acre vineyard in five different configurations. These include two split canopy systems; Geneva Double Curtain and Lyre spaced 6x11; two vertical systems, one spaced 6x8 and another at 4x6; and a traditional system spaced 7x11.

The graph includes establishment costs categorized into three major components: development (basic and site-specific), operating, and financing.

Basic development costs incurred in a typical replanting with all infrastructure in place include: land preparation, planting, trellis, and drip irrigation.

Site-specific costs include: drain tile, water supply, and frost protection. Depending on the circumstances there may be other site-specific costs, which were excluded, such as erosion control, terracing, and fencing.

Operating costs consist of farming, harvest, and overhead. The farming costs are labor and related benefits, leased equipment costs, materials, and utilities. Overhead includes property taxes, insurance, office, and management.

Financing assumes 100% of cash required, including interest borrowed at 9%.

Depreciation on the producing vineyard is based on vineyard development costs through the third year depreciated over the useful life of the specific component (10 to 20 years) using the straight-line method.

Given estimated yields for each vineyard configuration, the chart shows the price per ton required to cover annual costs. These annual costs do not include any debt service or expected return on investment related to land.

One could calculate tons per acre needed at a given grape price to cover annual costs. For example, the Napa County average price per ton for the 1993 vintage was $1,175. Based on the annual costs of $6,571 for the GDC 11x6, a yield of 5.75 tons/acre would be required to cover the annual costs.

Summary

This is a composite of estimated costs to establish and operate a high quality winegrape vineyard in the North Coast of California. These costs are typical of what is experienced but actual costs will vary from grower to grower.

*The above information comes from the **MKF Vineyard Cost Study**. The study is a 50-page detailed report available from Motto, Kryla & Fisher for $75. It can be ordered by contacting MKF at 999 Adams St., St. Helena, CA 94574, tel: 707/963-9222.*

Mike Walsh, President of Walsh Vineyards Management, Inc., Napa, California.

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By Dr. Richard Smart

The South is coming
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As wine increasingly becomes an internationally-traded commodity, wine export is no longer the exclusive province of the European producers — France, Italy, Spain, and Portugal.

Over the last several decades, important wine markets, such as the United Kingdom, Scandinavia, and the U.S., have imported ever larger quantities of wine from the so-called ***New World*** wine producers. Australia, New Zealand, South Africa, Chile, and Argentina are rapidly developing new plantings to support these and other growing markets. And there are signs some California producers are also becoming more committed to export.

I have been consulting in South America for several years and have witnessed some exciting viticultural developments there. In December 1994, on a consulting visit made through Europe, California, Chile, and Argentina, I observed some extreme contrasts.

The world wine scene

The European Economic Community is endeavoring to reduce a surplus of grape production by paying its members' grape growers subsidies to remove vineyards rather than add to the "lake" of distilled wine. In the south of France, in the Languedoc Roussillon region, and also in the world's largest vineyard area of La Mancha near Madrid in Spain, extensive areas of vineyards are being removed because of these subsidies.

This situation strongly contrasts with the situation in several New World countries, where new plantings are proceeding rapidly to meet the demand for wine exports, especially to European markets. This seemingly paradoxical situation is not passing unnoticed by European producers, many of whom are questioning traditional approaches which might be causing this loss of market share.

Technology in the South

Of the present South American producers, Chile and Argentina are attracting increasing attention because of their expanding wine exports.

These remarks cannot be taken as a generalization about the whole industry in both countries, as my consulting experiences are typically with the most progressive producers. However, as this situation applies equally to other countries, including the U.S., I feel some comparisons are valid.

Vineyard and winery developments in South America are based on importing world-best technology. These producers realize that their competitive advantage is to produce wines of appropriate quality at international price points.

Both Chile and Argentina enjoy an enviable range of climates, excellent viticultural soils, readily available irrigation water of high quality, and a large supply of cheap labor. Recent socio-political changes mean that in the future, farm labor will likely become more expensive and less available, although labor rates of less than $2USD/hour currently apply.

While these are important advantages in winegrape production, they are not sufficient in themselves to guarantee international competitiveness. So there is a considerable emphasis on using world-best technology in the current expansions of vineyards and wineries.

Example of technology adoption:
Las Palmas Vineyard in Mendoza

One vineyard in particular in Argentina, Las Palmas belonging to Trapiche Winery, springs to mind as an example of a vineyard using world-best practices. The vineyard is in the Mendoza region and enjoys a climate very suitable for producing high quality red and white wines. The vines being planted are the so-called *international varieties* — Cabernet, Merlot, Chardonnay and so on — but also including Malbec which has a reputation for quality in the region.

The soil is excellent for viticulture, consisting of a shallow loam topsoil overlying river stones. This soil drains readily and holds only a limited amount of water, so it will be relatively easy to precisely control the vine's water supply and to produce a desired level of water stress late in the growing season to give good wine quality with minimal yield sacrifice.

One advantage Argentina enjoys is the opportunity to import vines ready for planting. Italian nurserymen, in particular, have been supplying high quality bench-grafted plants (at around $1USD each!), and these are the best clones in a wide range of both wine grape varieties and rootstocks available in Europe. Argentina has phylloxera but now has a wide range of excellent rootstocks to counter this pest in future plantings.

The vines at Las Palmas are being trained to modern trellising systems, for example, the Scott Henry (developed in Oregon) and the Smart Dyson (developed in California). As a consultant, I have recommended these systems based on my observations of contemporary economic performance in many vineyards of the world. This means that the practices used at Las Palmas are at the cutting edge of ***world-best practices.***

In the Las Palmas vineyard trellising, the end assembly is sufficiently strong and uses wooden posts with an anchor, and the intermediate posts — almost six feet above ground — are also wooden. Wire is high tensile and correctly tensioned, in great contrast with many other vineyards worldwide I have visited.

The first fruiting wire is at a minimum height of 44 inches. This combination of taller posts and a relatively high fruiting wire will allow some flexibility in moving between future trellis designs, should this be desirable.

Young vines are being well-irrigated and given nitrogen fertilizer through the drip system to encourage early growth. The intention is to form some fruitful buds on the fruiting wire by the middle of the first growing season, so that by early in the second growing season, vines will achieve 100%

wire-fill and produce a modest crop for harvesting, say two to three tons/acre. Then, in the third year, the vineyards will be producing at almost 100% of their yield potential, estimated at around eight tons/acre, depending on variety and wine style.

The vineyard will be mechanically-harvested and mechanically pre-pruned, with hand-pruning follow-up to ensure correct bud spacing (about 2-3 spurs per foot of canopy). A particular advantage of machine harvesting is the ability to deliver cool fruit to the winery during the night and early morning. Machinery from France and New Zealand is being investigated.

The vines are drip-irrigated using Israeli components, including a computer-based control system. An Australian electronic soil moisture sensor has been installed; this can be directly connected to the irrigation controls and also to a weather station. This soil moisture measuring system is so accurate that hourly changes in root zone moisture can be measured and displayed on a computer screen. With sufficient sensors located at appropriate depths, soil moisture can be monitored and irrigation delivered exactly. A series of plant observations will supplement the soil moisture measurement system.

In summary, this vineyard is using the best technology available in the world for grape production.

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Other technological applications

There are many other vineyards in Chile and Argentina which also are using world-best technology. Chile, in particular, is planting many new vineyards for the wine export trade, and those installed by the larger companies have a particular emphasis on newer trellis systems.

Until recently, the lyre system has been the most popular, but this status is being questioned by many. The lyre is the most expensive of all systems to install, and for the moment, it cannot be mechanically harvested. Also, it is not suited to high vigor vineyards. On my recent visit to Chile, I saw several lyre systems which were creating unbalanced vineyards with excessive vigor. In fact, first commercial experiments to overcome this problem are now under way with a new training system, termed the *Smart Dyson Ballerina Lyre.*

Overhead canopies, like the Italian Tendone (also called the *Parron* or *Parronales*), are common in both Chile and Argentina, especially for table grapes but also for wine grapes. While capable of high yields for vigorous vineyards, they typically produce poor wine quality and require high labor input.

Recent commercial experiments in Mendoza (Argentina), where overhead canopies are converted to the Geneva Double Curtain or a new system, the *Smart Mayorga* (like a Te Kauwhata Three Tier laid horizontally), have shown the possibility of very high yields with substantially improved wine quality. Yields of 15 tons/acre have been obtained, and the Smart Mayorga can be mechanically-harvested.

The Scott Henry system is becoming much more common since a group of Chilean viticulturists visited Australia and New Zealand in June 1994. Again modifications to the common "Californian" training system (a narrow fruiting tee with a fixed-wire crossarm system for the foliage) are being evaluated by several companies during the 1994-1995 growing season. (This system, termed the *Smart-Dyson Ballerina La Rosa,* will be the subject of a future column.)

Attitude to technology adoption all important

In my experience, South American viticulturists are the most willing to commercially evaluate new technologies and even novel ideas. They typically read a range of European, Australian, and American magazines (including this one), and they are willing to travel to improve their knowledge. Their technical staffs are young, well-trained, and of mixed gender; in my experience these factors lead to the most ready adoption of new ideas.

This difference was highlighted for me during the recent trip. In Portugal, a client tried to tell me that converting his vigorous vineyard to Scott Henry would "cause the vines to die." In California, I was told "the Scott Henry will not work here and anyway it is too expensive." In Chile, where they have already had several years of successful experience (including commercial winemaking) with the Scott Henry and the Smart Dyson, they are now evaluating the next generation of ideas in trellis systems.

In conclusion, wines of the South are coming soon to a bottleshop near you. Chile has been invited by the U.S., Mexico, and Canada to join NAFTA immediately, and all of South America will be included by 2005, which makes this development all the more likely. ■

SOIL MOISTURE:

Water management

in California's North Coast

by Michael A. Porter

Historically, many Napa and Sonoma county vineyards have been irrigated as if they were in the San Joaquin or southern desert valleys of California. This is primarily because a wealth of published research exists addressing desert irrigation of table and raisin grapes grown in California and Australia.

Considering the vast differences in climate, soil, scion, rootstock, pests, pathogens, and most important end product, desert viticulture and the viticulture of the winter-rainfall regime of the North Coast region of California have little in common — irrigation is no exception. In addition, desert research (published to date) deals primarily with yield and cannot tell us much about potential wine quality.

If previous research offers little helpful direction to the grower about how to properly irrigate, what help is available? A number of water management strategies are in use today, and fall into three general groups: foliar measurements, "water budgeting," and measurement of soil moisture. Unfortunately, few of these offer useful data to the premium wine grower.

Foliar-based methods

Measuring leaf temperature, leaf water potential, and/or stomatal conductance to determine water deficiency assumes that because water-deficit-stressed vines have elevated leaf temperatures and water potentials, and often (but not always) reduced stomatal conductance when these symptoms are present, vines are suffering water-deficit stress. That isn't necessarily so.

High leaf temperature and these other symptoms can result from mites, potassium deficiency, phytopthora, phylloxera, armillaria, or any other stress that inhibits the uptake, transport, and transpiration of water. In the desert, water-deficit stress is the most common kind of stress, so foliar-based methods will likely prove to be useful there. In the North Coast, however, water deficit is just one of many kinds of stress, and it is not safe to assume that all stress is due to lack of soil moisture.

One more useful foliar observation is shoot-tip growth. Because shoot-tip growth ceases with water deficiency, one can logically conclude that vines showing active shoot tips do not suffer from lack of water! (However, lack of active shoot tips cannot be assumed to imply dry soil!) Shoot tips will stop growing prior to veraison if the vines lack certain nutrients and/or are over-cropped, and they should stop growing at veraison in any case.

Water budgeting

In another method common to desert viticulture, the grower calculates the rate of soil evaporation and vine transpiration (ET), then subtracts the total loss from an assumed soil moisture reserve to decide when to irrigate. The popularity of this method is due primarily to its economy. It assumes that vine water use is dependant on the weather and the size of the vines, that all vines behave the same as the Sultana studied in the San Joaquin and southern desert valleys, and that many factors can be ignored (e.g., root depth, K/Mg status of vines, scion, rootstock, wine style, market niche). Such assumptions can be misleading.

An analogy might be: enter into a computer the make, model and year of your vehicle, total miles driven, and type of working load (including hills, wind, cargo, driving in low gear, etc.) since the last time you did the calculation, and the computer will tell you whether or not you need to add oil! (Which would you believe - the computer or the dip-stick?)

Measuring soil moisture

The most accurate method of measuring the water content of soil is to weigh a sample, let it dry out under controlled conditions, then re-weigh it — the lost weight tells you how much water you had. This "gravimetric" method is the standard by which all other methods are calibrated.

Though an accurate measure of one sample, this method is not a practical way to monitor soil moisture in vineyards because the sampling is not reproducible, because each new sample requires a new hole which is unlikely to identically match any prior sample due to soil variability.

For any measuring method to be reproducible, it must monitor exactly the same soil at the same location and at the same depths over time. It is also laborious and time-consuming to spend one's summer digging holes to take new samples. It is far more efficient to monitor soil moisture with an instrument.

The most commonly used monitoring tools are tensiometers, conductivity (e.g., gypsum) blocks, and neutron probes. Other tools, such as time-domain-reflectometers (TDR), have been researched for

years but are not widely applied in vineyards.

Each method of monitoring soil moisture has advantages and disadvantages, as discussed below. All methods are limited by variability of soil. No matter where you measure, the results are only applicable where soil type and rooting depth are similar. Areas having different soil types may require separate monitoring and often require separate management, but producing fine wine often requires no less.

Terminology

Healthy, uncompacted loam is roughly one half solid (mostly mineral) matter and one half pore space. If the pores are completely filled with water, the soil is saturated. Once the excess moisture drains out, the pore space will be about one half air and one half water, a moisture level called field capacity (FC).

A commonly used unit of moisture (in the U.S.) is "inches of water per foot of soil." In our example, saturation is six inches (of water) per foot (of soil), and field capacity is three inches per foot. Roughly half way between field capacity and absolutely dry soil, vine roots are unable to extract any more moisture. That is, of the three inches at field capacity, 1.5 inches is available and 1.5 inches is unavailable.

When no available moisture remains, the soil has reached the permanent wilting-point (PWP). Thus, it is the moisture content of the soil relative to the PWP that most concerns growers in terms of irrigation. Moisture content above FC is more pertinent to root function (roots need air!) and health, including pathogens such as phytopthora and pithium.

Clay loam soil has a FC a little above 4 inches and a PWP near 2; clay has a FC near 4 and a PWP between 2 and 2.5 (depending on the type of clay). Sandy soils have FC and PWP less than loam, whose values decrease as the sand content increases. Rock and gravel decrease the FC and PWP just as sand does.

Tensiometers

A tensiometer is a water-filled tube with a porous tip at one end and a vacuum gauge at the other end. The tensiometer is inserted into the soil to be tested, and as the soil drains from saturation to FC, water diffuses through the porous tip registering as a partial vacuum on the gauge.

A little below FC, a tensiometer will not hold a vacuum, that is, all of the water diffuses from the instrument. Since a tensiometer is limited to the range between saturation and a little below FC, it can be used to monitor drainage but has limited value for managing irrigation in the North Coast.

Keeping the root zone near or above FC all summer in Napa and Sonoma counties can lead to root-rot, excessive vigor, and wine quality problems. Tensiometers are probably best adapted to the "light, frequent" irrigation strategy developed for desert table and raisin grapes, where North Coast concerns do not apply. The main advantage of tensiometers: they are economical to buy and use.

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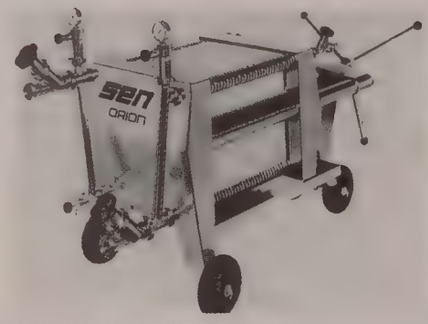

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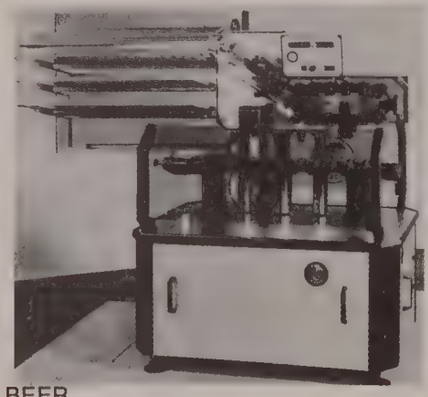
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Conductivity blocks

By measuring the electrical conductivity between metal screens imbedded in a material (e.g., gypsum) whose conductivity varies with water content, one can inexpensively measure soil moisture. In practice, gypsum blocks have six major limitations.

First, they are prone to decompose in soil in as little as a few years and become unreadable. To monitor long-term involves a program of regular replacement, which adds to the cost.

Second, they are limited to the range between PWP and a little above FC. From saturation to near FC they give no data. This range is important to root function and health, and data can indicate the need for improving or installing a drainage system. One could employ both tensiometers and gypsum blocks to cover the full range (though installing four and five foot-long tensiometers is a task I will leave to others), again adding to the cost.

Third, installation involves repacking soil on top of the sensor in the same order that it was removed and as closely as possible to the original degree of compaction. If not done properly, the final equilibrium around the sensor will be different from that outside the disturbed soil volume.

Fourth, it can take weeks or even months for a new sensor to reach equilibrium with the surrounding soil. They are best installed in the fall prior to the year to be monitored. If replaced during the summer they may give little or no useful data the rest of that season.

Fifth, above FC (which is typical in North Coast subsoils in the spring and early summer) they read "maximum conductivity" which, unfortunately, is the same reading as an electrical short-circuit due to decomposition or a rodent chewing the insulation off of the wires. One can't tell if the subsoil is saturated, or a bit above FC, or the unit is not working. One can dig nearby and do a gravimetric test, but this defeats the purpose of monitoring with a sensor. One can monitor with multiple sensors at the same depth, using redundancy to check for malfunction, but this reduces the cost-effectiveness.

Sixth, gypsum blocks and tensiometers monitor a very small volume of soil close to the sensing element. Depending on distribution of roots and rocks, this small volume of soil may or may not be representative of the soil at that depth. Measuring a larger volume of soil is preferable. Installing multiple units might help, again adding to the initial cost plus maintenance and replacement, but a vine row containing redundant sensors needs special protection if you practice mechanical weed control!

If I considered tensiometers and conductivity blocks to be accurate, reliable, and economical, I would use them. In my opinion, their accuracy is unimpressive, their reliability is dubious, and their economy is superficial when maintenance and replacement (including labor, aggravation, and lost data) are included.

Neutron probes

Neutron probes are the standard tool of researchers. They are able to measure across the full range from saturation to below PWP and give the most accurate and reliable data in practical vineyard

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application. The main disadvantage is expense, either to buy your own or to hire a service.

(We should note that non-nuclear gauges being researched and developed are just as expensive to buy. When you pay for a service, you are paying for data and consulting — the instrument costs far less than the truck that carries it to your vineyard!)

A neutron probe detects hydrogen in the water molecules in a volume of soil about the size of a soccer ball around the outside of an aluminum tube permanently installed in the soil. (Steel or PVC tubing can be used, but reduce the sensitivity of the gauge.)

By taking readings at different depths over time, we can observe drainage, root extraction of moisture, and topsoil drying. If a tube is damaged, it can quickly be replaced without disturbing the soil or having to wait a long time to reach equilibrium. The instrument is an "overgrown smoke detector" (the one in your home detects hydrogen in the hydrocarbons present in smoke), and is harmless to the operator and the vines.

The graphs shown are from neutron probe readings in North Coast vineyards in recent years and represent various soil situations, rooting patterns, and irrigation practices. The examples shown are typical but not exhaustive.

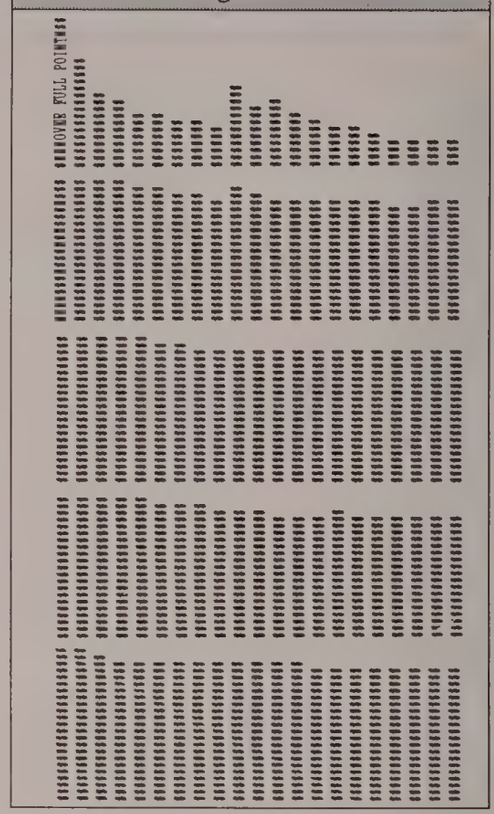
How to read the bar graphs

The following bar graphs (Figures 1-15) represent soil moisture readings in the range between a bit above PWP to a little above FC. Each major segment in the vertical stack represents one foot of soil depth. Each column of bars represents one week's measurement. Readings were taken weekly, from mid-April in most cases through harvest. (Clients receive tables of data also.) Discussion of these graphs will address some old myths.

Examples and myths

Figure 1 shows a 1992 site planted with a grass cover crop but no vines. Note that the top foot of soil dried rapidly in the first few weeks, gained a bit from rain mid-season, then dried steadily through September. From the

Figure - 1



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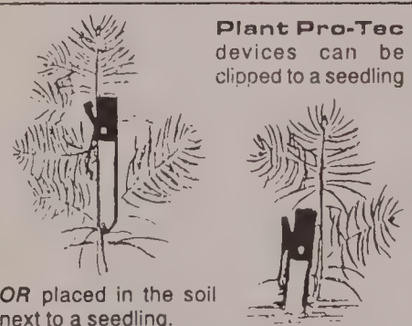

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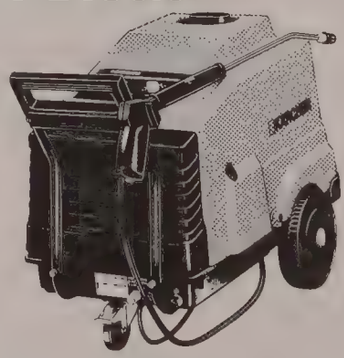

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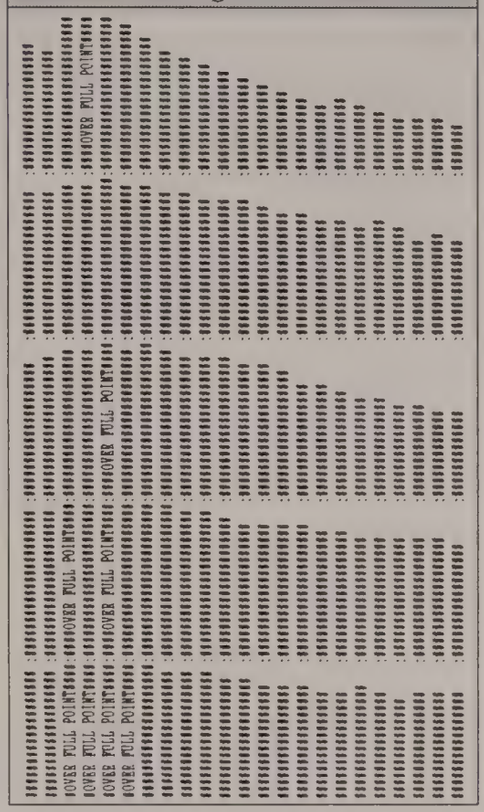
second foot down to the fifth foot, the readings plateau at FC as there were no roots to extract the moisture.

Myth One: "Cover crops take a lot of moisture away from the vines." In fact, some cover crops (e.g., Bermuda grass, morning glory) can extract deep soil moisture, but shallow-rooted grasses (like the rye shown here) really don't. The top foot of soil will dry out with or without a cover crop, and most species of cover have little effect below that. For more on this, contact the Soil Conservation Service.

Figure 2 is from a deep-rooted, non-irrigated site on Knoll-2 at Peter Michael Winery on the slopes of Mt. St. Helena in 1990. The soil was near FC at all depths to five feet prior to the late-May rains and drained again to FC by mid-season. At all depths, the readings declined through harvest (but not a lot) and finished below FC, indicating root uptake of moisture. Note that some water was extracted from all depths, but only the top foot came anywhere near depletion (PWP).

This pattern of water use is consistent with other sites where we have measured

Figure - 2



as deep as ten feet. Deep-rooted vines use only a fraction of the available water and finish the season with plenty of moisture in unused reserve.

Myth Two: "Vines need to be water-stressed late in the season to ripen the crop." It just ain't so — these vines ripen normally and produce intense Cabernet. Perhaps we could correct Myth Two by rephrasing it: "Over-irrigated vines have difficulty ripening"!

Then there's **Myth Three:** "Dry-farmed vines are water-stressed." Well, some are — if they are on shallow soil. Dry-farmed just means non-irrigated, if the roots go half-way to China, the vines will not experience water deficit!

Figure 3 is from Kenwood Winery's Yulupa Vineyard Chardonnay in 1991. Here the extraction of moisture was more complete, due to very rocky soil below two feet which holds very little available water.

When viewing these graphs, it is very important to remember that the vertical scale for each foot of soil varies in proportion to the range of available water holding capacity in that soil. Here the soil was

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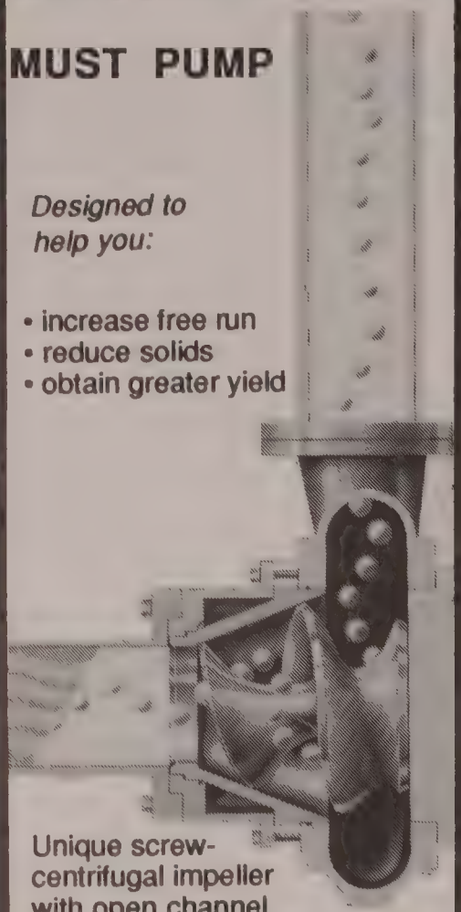

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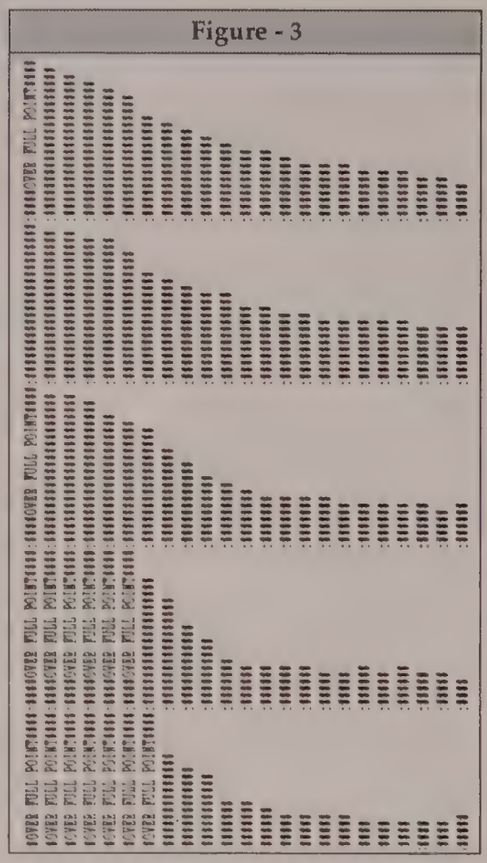
Figure - 3



not depleted by harvest, but the remaining available reserve was far less than at Knoll-2.

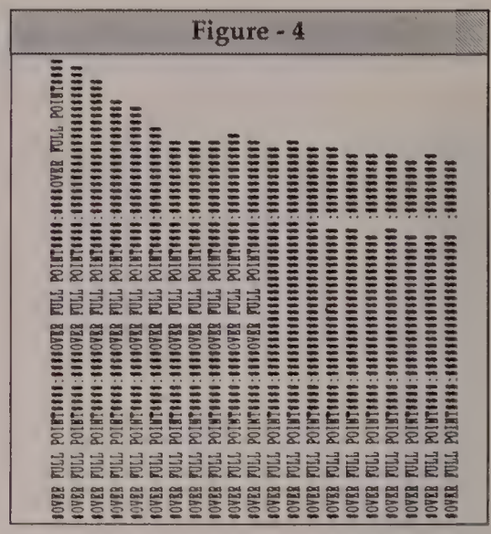
Note that from mid-season to harvest the Yulupa Chardonnay vines used very little water. They were able to conserve moisture very well owing to their excellent nutrient balance. Due to their poor control of stomata, potassium-limited vines would not be able to do this.

Figure 4 illustrates a key concept: transpirational demand varies considerably among mesoclimates. This site in Carneros has a solid hardpan at three feet with no deep roots and is not irrigated (1992 shown). By harvest, the top foot of soil was fairly dry, but the second foot was barely down to FC, and the third foot had not yet finished draining! These vines use almost no water all season because Carneros is cool and humid, and the vines had little need to transpire water to cool their leaves.

Myth Four: "Due to shallow rooting, vines in Carneros need frequent irrigation — usually 10 gallons/week." With transpirational demand near zero, many irrigated vines in Carneros (and Russian River) undergo luxury consumption of excess water and might make better wine if "dry-farmed."

Figure 5 shows the 1993 readings from a vineyard in Dry Creek Valley which

Figure - 4

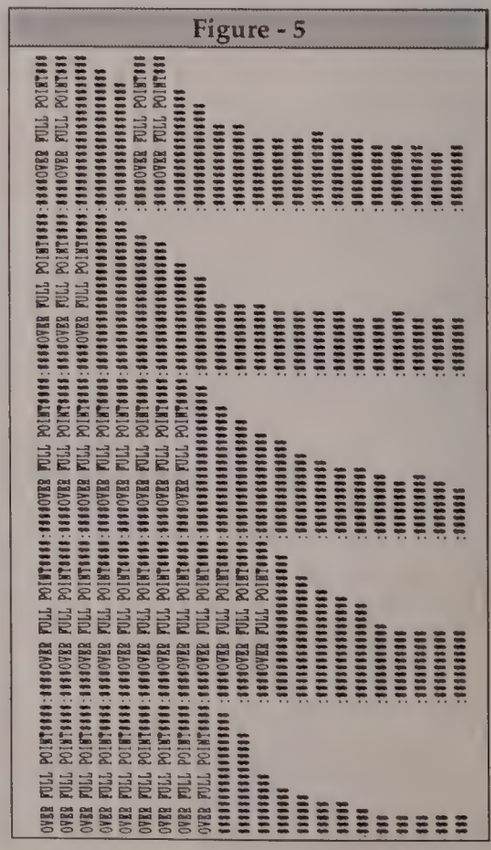


was planted in 1986 and irrigated frequently through 1991. **Myth Five:** "Frequent irrigation of young vines will cause them to develop only shallow roots." It sure didn't work here!

Actually, one can "perch" roots if there is some impediment to deep rooting inherent in the site. In the North Coast, this would include hardpan, gravel strata, clay layers, or any other sharp physical soil boundary. In the desert, one can perch roots simply by keeping irrigation amounts light — roots won't grow beyond the emitter-wetted zone because the surrounding soil is too dry.

But in deep, well-drained soils of most fine wine producing regions, there is abun-

Figure - 5



dant moisture outside the emitter-wetted zone every spring and irrigation alone does not impede roots. In this example, the new owners in 1991 were alarmed by severely stunted growth on many of the vines in spite of all the irrigation.

It turned out that the vines had phytopthora and were suffering because of all the irrigation! In 1992 (under new management), the vines received zero irrigation and showed the same pattern of water use in 1992 and 1993. By letting root extraction dry out the soil somewhat, many of the weak vines have improved (but others are too far gone and will need to be replaced).

Too-frequent irrigation may be hazardous to your vine's health and to wine quality. Actually wine quality is affected *long* before vine health becomes an issue.

Figure 6 shows June through September 1992 readings in a new Alexander Valley vineyard. The vines were planted and irrigated prior to the second week of readings, so the graph shows a small gain in moisture to five feet. The vines were irrigated in July, but likely would not have been had we known it would rain one week later. The final irrigation in August resulted in moisture gains at all depths. In the last few weeks, note the decline in subsoil moisture to the third foot indicating root development to that level. When not over-irrigated, young vines often show significant root development as early as the planting year.

Figure - 6

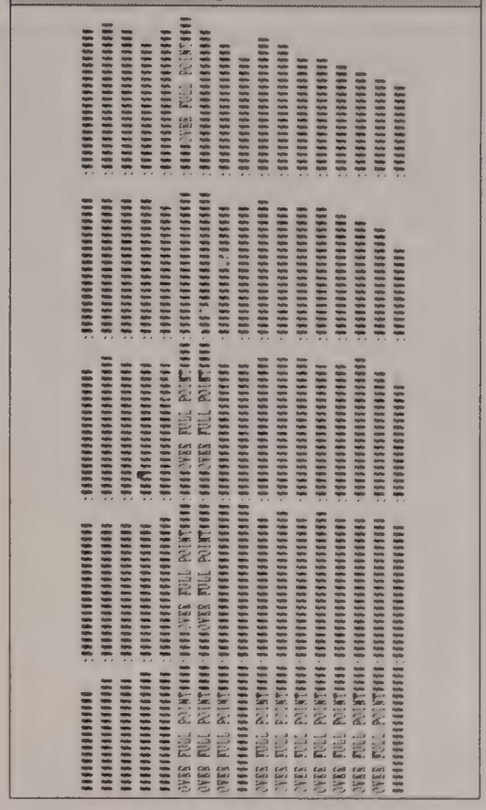


Figure 7 shows the same site in 1993, which had gain from the late rains but no irrigation all summer. Shoot growth was vigorous, as was root development. By the end of the season, the vines clearly had roots to three feet, likely four feet and possibly five feet. These vines may never again need to be be irrigated!

Myth Six: "Young vines develop roots very slowly and need irrigation for years." Well, some do and some don't. Many young vines are irrigated on speculation, as they are not actually checked for root development.

Of course, not all soils are deep and some vines will always need supplemental water. Figure 8 is from Signorello Winery's Hill Chardonnay in 1993. With

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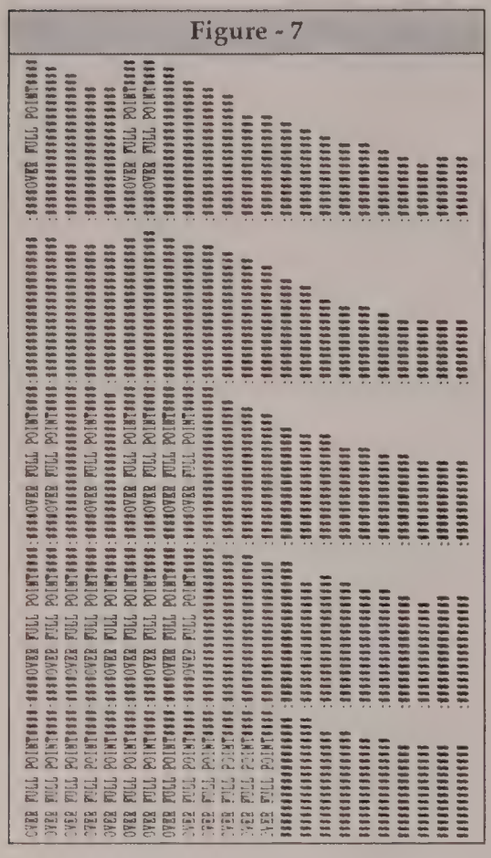
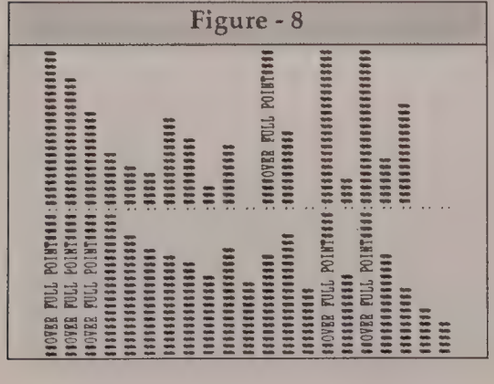
Figure - 7



very solid bedrock below two feet, there is no hope of ever developing deep roots. Rain in late-May partly moistened the top foot and the first irrigation was in late June. The total water applied here ranged between 100 and 150 gallons/vine each year, depending on the season, in five or six applications (including post-harvest, not shown).

Myth Seven: "Vines on shallow soil need weekly, if not daily, irrigation to avoid stress." Some do, especially if the "stress" is due to potassium deficiency! The vineyard shown here has excellent nutrient balance, so is much more "drought tolerant" than is typical. Even in years as hot as 1993 and 1988, these vines went from two to three weeks between irrigations, depending on observed rate of use, weather, foliar appearance, and time to harvest.

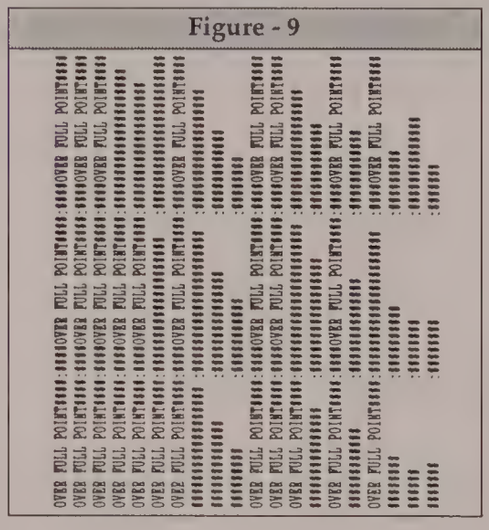
Figure - 8



On the hill behind Kenwood Winery, holes were jack-hammered into bedrock, filled with what little soil was available and planted in 1985. Soil moisture in 1993 is shown in Figure 9, with late-May rain, three full irrigations and a light watering two weeks pre-harvest. (A full post-harvest irrigation is not shown.)

As in the previous example, nutrient balance including potassium was excellent, so the vines were more drought tolerant than is common. Of course, these vines could be irrigated far more than they are, but are not for reasons of wine quality.

Figure - 9



Figures 10 and 11 are from 1992 and 1993 respectively in the Palo Verde vineyard in the Napa Valley, belonging to Robert Brittan, winemaker at Stag's Leap Winery. Two feet of loam is underlain by clay loam whose (natural) compaction increases with depth. As a result, much of the root uptake of moisture occurs in the top three feet of soil due to deep roots having less pore space from which to take water. Note that the vineyard received more irrigation in 1993, which was a much hotter summer than 1992. This may surprise some people who have heard that 1992 was the "fifth year of the drought." In fact, the North Coast has not had a drought since 1977!

The Central Coast of California has had serious water shortfalls in recent years, especially in big cities. The San Joaquin and southern desert valleys are always arid and must import water to grow grapes at all. But in the North Coast, we have had sufficient rainfall every winter since 1977 to replace all moisture removed by roots the previous summer!

Table I lists (by figure number) the total moisture content of some of the examples in this report in April 1992 and 1993 (in inches). The winter/spring of

Figure - 10

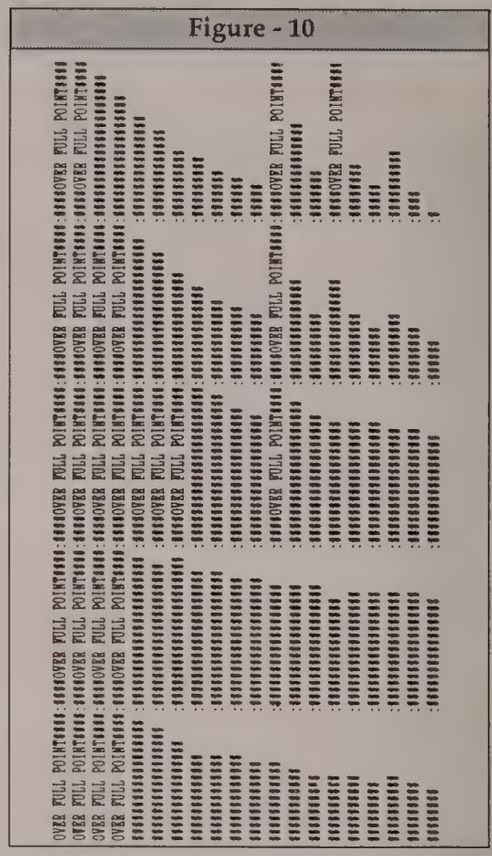
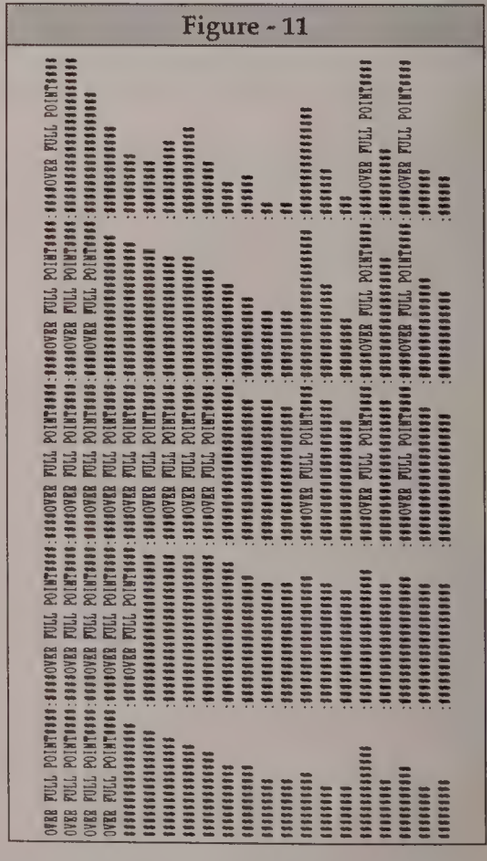


Figure - 11



1993 rainfall was well above average, yet the so-called "fifth year of drought" in 1992 shows just as much soil profile refill! That is because 20 to 25 inches of rain is not a drought where vines extract less than half that amount during the

Table I

April soil profile total water content in inches

Figure #	1992	1993
1	17.2	17.0
2	20.9	19.9
3	21.9	22.3
4	14.0	13.9
5	19.5	19.9
10/11	21.2	21.6
15	19.0	19.5

growing season.

Readings taken in various sites confirm refill of North Coast soils to a depth of at least 10 feet every winter during the so-called five-year drought.

Much speculation has centered on the effects of "the drought" on wine quality, phylloxera, vigor, yield, etc., when there actually has not been a drought in terms of soil moisture. This speculation has been fueled by media attention to water shortfalls in other parts of the state and in other aspects of water supply (eg., reservoirs for Santa Clara County, the snow pack in the Sierra Nevada Mountains) which simply are not relevant to North Coast vineyards. Many new myths have resulted from "the drought" that never was.

There is no industry consensus on how to manage soil moisture. There likely never will be one "best" strategy due to the site-specific nature of producing fine wine and the wide range of varietals, styles, and market niches. There is general agreement that "over-irrigation" diminishes wine quality, but there is little agreement as to what constitutes over-irrigation.

I suggest letting wine quality, vineyard productivity, and vine health be the arbiters of debates over viticultural practices. Fig. 12 shows a Carneros vineyard irrigated weekly from mid-June through late-August, in which there were roots below three feet. This is more water than the vines actually need, but as long as the winemaker and accountant are happy and the vines don't get root-rot, all is well.

More about stress and water use

Figures 13 and 14 are from sites in adjacent sections of a vineyard. They had very similar soil, crop load, canopy management, and the same rootstock, spacing, trellis, and row direction. The main difference between them was that the vines in Fig. 13 were treated with sufficient potassium and had a bloom petiole K/Mg ratio of eight, while the untreated vines in Fig. 14 had a ratio near two.

The vines in Fig. 14 used nearly twice as much water during a season as vines in Fig. 13, and showed late-season foliar "stress" symptoms. Irrigation would likely have reduced the symptoms a little, but might have delayed ripening and could have reduced the intensity of the finished wine. It is vital to keep in mind that there are many kinds of "stress" and that water deficit is only one of them.

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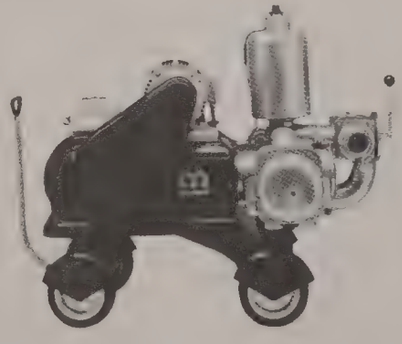

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Figure - 12

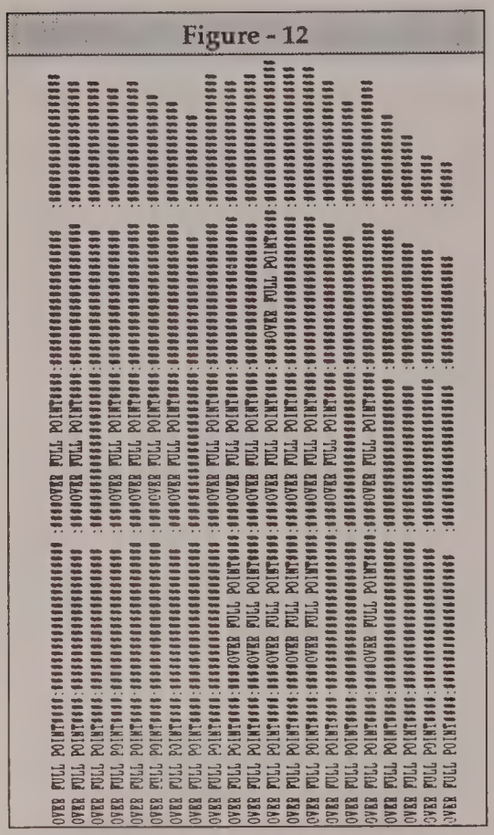
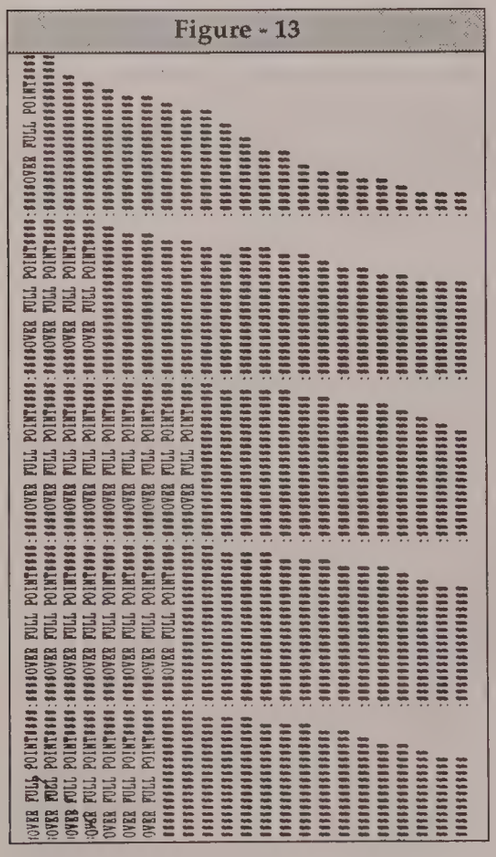
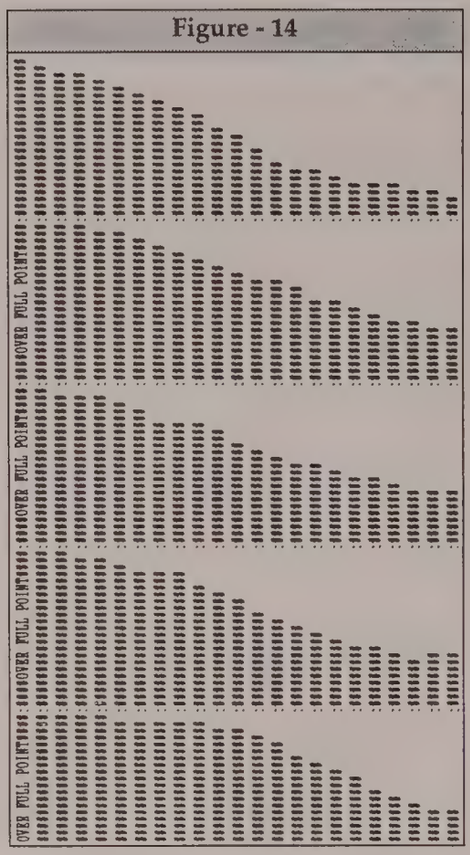


Figure - 13



leaf water status is mediated by potassium in all grape scions. Vines with adequate potassium are able to control water loss on hot afternoons. They typically turn their leaves "side-ways" to the sun to reduce their heat load, but they do not suffer dehydration.

Figure - 14



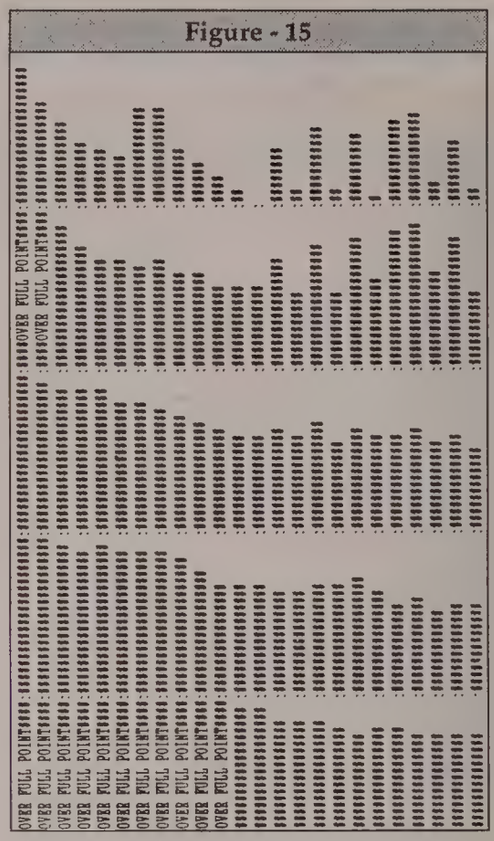
Vines with low K/Mg status are unable to close down their stomata, especially after veraison when the crop is drawing potassium from the rest of the vine. Low K/Mg vines suffer higher rates of water loss, even if soil moisture is adequate, and find it difficult to move water fast enough from root to leaf to keep up with demand. Leaf dehydration due to potassium deficiency looks like soil moisture deficit to many growers.

As the severity of the deficiency increases, a number of metabolic functions are reduced, including root conductivity, carbon-dioxide assimilation and photosynthesis, stomatal and (especially) mesophyll conductance. The vines shift from high to low transpiration, sugar production and translocation are slow, leaf temperature and visual "stress" symptoms high.

Figure 15 shows such a vineyard, having low K/Mg status and unmistakable post-veraison potassium deficiency symptoms. Starting in late July, irrigation was used to combat increasing foliar "stress" symptoms, but to little avail. The vines showed basal-to-midshoot yellowing and defoliation (in full sun — no shaded canopy here!) which increased slowly but steadily, week by week.

The lack of response to irrigation often surprises people. Some assume that the vines must have leafroll virus, or

Figure - 15



phylloxera, or some unknown malady.

Potassium deficiency is often wrongly ruled out based on bloom petiole potassium being above the 1.5% minimum sufficiency level established for Thompson seedless, with no evaluation of K/Mg balance.

Increase in fruit K and pH progresses steadily, as does decline in TA, but gain in sugar is much slower than in premium vineyards. The time from veraison to harvest is extended by three to four weeks!

By the time sugar is up to minimum harvest level, the TA is low and the K and pH high. The problem in this vineyard is slow sugaring of the crop, more than fast K accumulation.

The "cure" involves raising the vine K-to-Mg status so that the leaves will not dehydrate and fall off, so that they can ripen the crop at a reasonable rate, so that the normal rise in fruit K and pH is balanced by a normal rise in sugar. Irrigating potassium deficiency is a commonly used band-aid — but not a cure! ■

Editor's Note: Please note the author's error in the May/June'94-***PWV*** at the bottom of the right-hand column on page 61. It should read: "where petiole levels below 0.35% (not 0.25%) cause concern." Actually, anything below 0.4% gets our attention.

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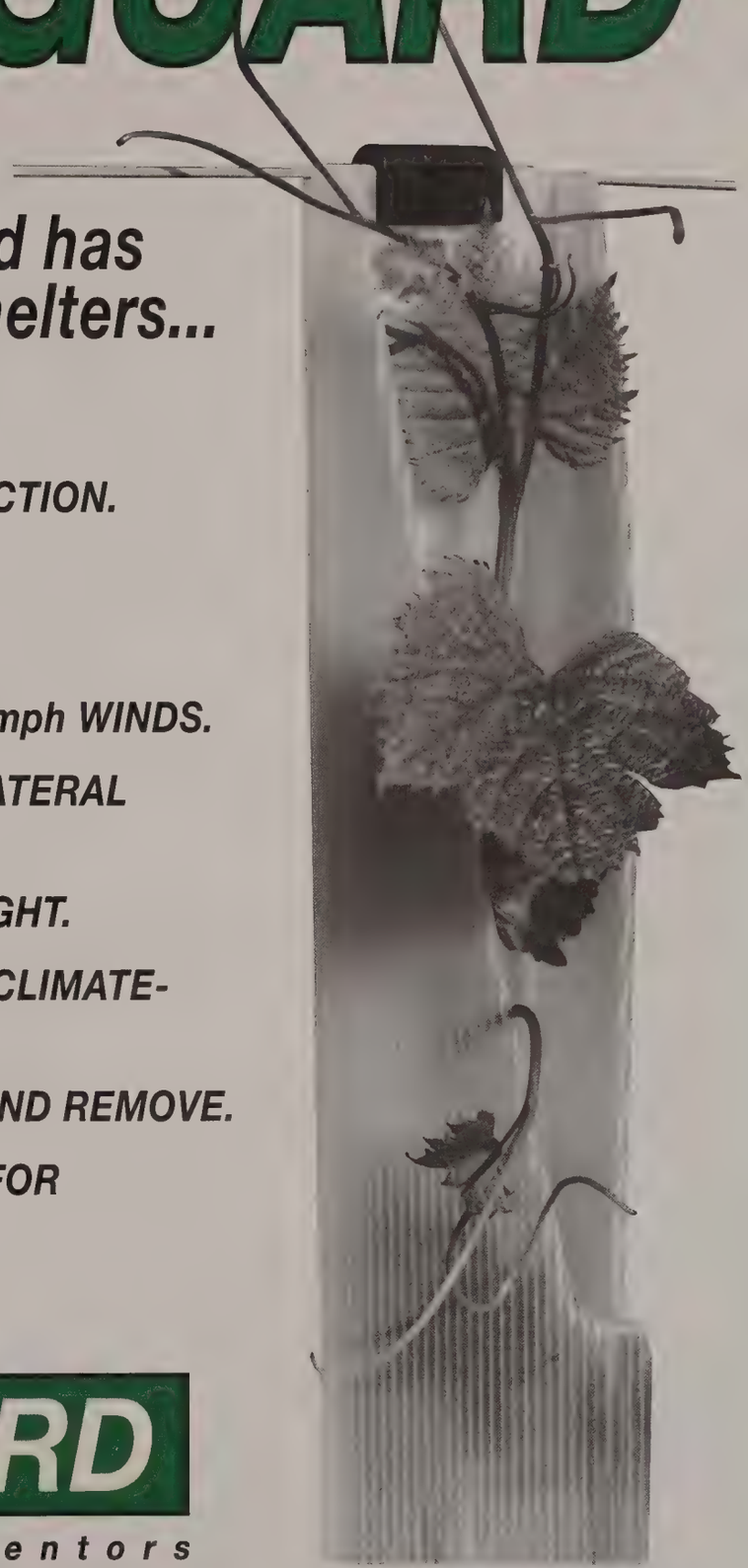

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VARIETAL REVIEW

by Eleanor & Ray Heald

California's Russian River Valley Pinot Noirs are cohesive, with flavors that fit together, say producers. They are also similar in flavor profile with supple and velvety mouthfeel.

Winemakers Gary Farrell, Davis Bynum Winery and Gary Farrell Wines; Fred Scherrer, Dehlinger Winery; George Davis, Porter Creek Vineyards; Tom Rochioli, Rochioli Vineyard & Winery; Rick Sayre, Rodney Strong Vineyards; and Carol Shelton, Windsor Vineyards are generally of one mind when discussing Russian River Valley (RRV) Pinot Noir.

In this regionally-focused Pinot Noir varietal review, ***PWV*** attempts to discover many of the cohesive elements.

Style similarities

"Depending on the clonal selection, red cherries or black cherries are the characteristic fruit in both aroma and flavor," Sayre begins. "Heavier-colored clonal selections tend toward black cherries and the lighter-colored toward red cherries."

Independent of color, RRV Pinot Noirs have a supple, velvety mouthfeel, Sayre suggests. "This separates RRV Pinots from those of the Carneros region. Frequently, I find Carneros Pinots more tightly wound."

Additional aroma and flavor distinctions run the gamut from fresh strawberry, plum and dried rose petal to sandalwood, leather, toasty oak, and hints of barnyard (gamey or meaty).

Regional uniqueness

Rochioli, who in each vintage produces 13 different bottlings to better express regional and vineyard sites, continues, "Carneros Pinots are very showy, but many lack the concentration and mouthfeel of RRV. I enjoy Central Coast Pinots because they are completely different. In the RRV, we get full, rich, concentrated flavors and supple wines."

Scherrer, who bottles two or three different Dehlinger lots each vintage with the same aim as Rochioli, points out that RRV Pinots have a big, rich mouthfeel without aggressive astringency. With the various bottlings, blended from about 16 fermentation lots, he strives to reflect the balance and personality of various parts of the Dehlinger vineyards.

"There are spectacular wines produced in other regions in a given year from an individual producer, but RRV's strength is consistency, year to year, producer to producer," Davis maintains.

Besides wines of elegance and balance, Farrell seeks to make wines with good cellaring potential. "I want the wine to be fruit-focused with regional identity, but complexed by winemaking influences," he stresses.

Davis, on the other hand, wants wines that are very approachable upon release. His goal is to make accessible the inherent characteristics of the varietal grown on a particular piece of ground with a minimum of "stylistic overlays" which may obscure those inherent characters.

Shelton's stylistic aims are similar. "I strive to showcase the voluptuous, velvety character of RRV Pinot Noirs and all their cherry fruit in a wine that is food-complementary and ready to drink young." She contrasts this with a Reserve bottling that is 50% RRV, 50% Monterey; the Monterey fruit contributes more peppery spice, deep color, and a maturity profile that is opposite that of RRV fruit. The resulting wine is much more structured and ageable, but does lack some of the RRV "fat velvet."

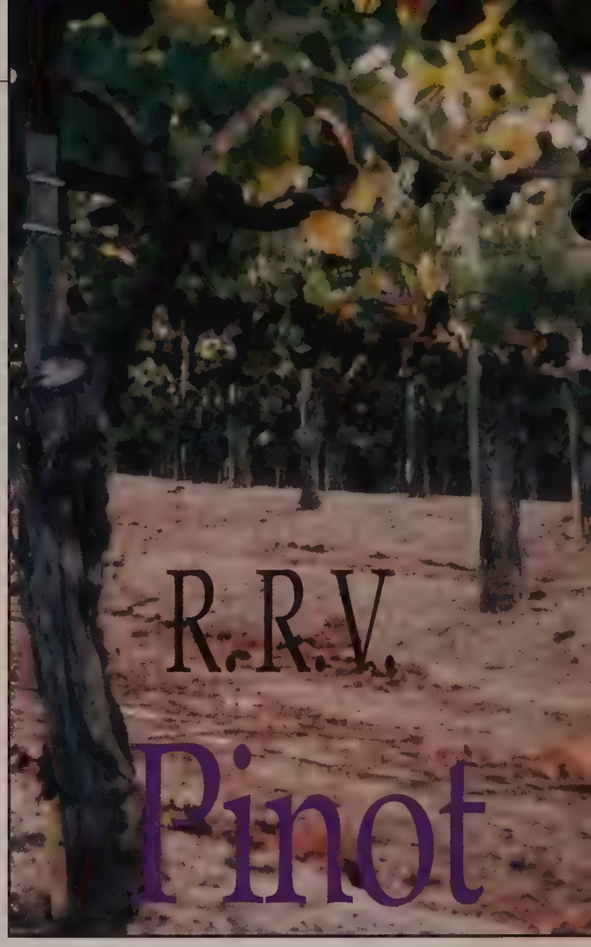
Harvest parameters

Most of these winemakers agree that pH is the critical factor in determining optimum harvest. When pH is 3.2 to 3.3, it is important to look at both the fruit and the vineyard. Leaves around the fruit zone are beginning to yellow and sugars are in the range of 23° to 24° Brix.

"Because most RRV producers choose hands-off winemaking techniques with Pinot Noir, lower pHs tend to keep things safe microbiologically," Rochioli comments.

Scherrer has found most success with picking riper (about 24.5° to 25° Brix), but says pH stays about 3.25 even at the higher sugar levels. Harvest parameters depend on the vintage, and correct flavor and texture are found within a wide range of chemical analyses. Certain vintages require less adherence to numerical guidelines, and more subjective decision making. "Strangely enough, as I grow older, I trust my senses more than a formula or a recipe," notes Scherrer.

The TA range is 0.80 to 0.90. Farrell will pick as high as 0.95 and Rochioli doesn't consider 1.0 unmanageable.



Pinot Noir waiting for harvest at Dehlinger, photo by Fred Sherrer.

DAVIS BYNUM

Gary Farrell, winemaker

Vineyards

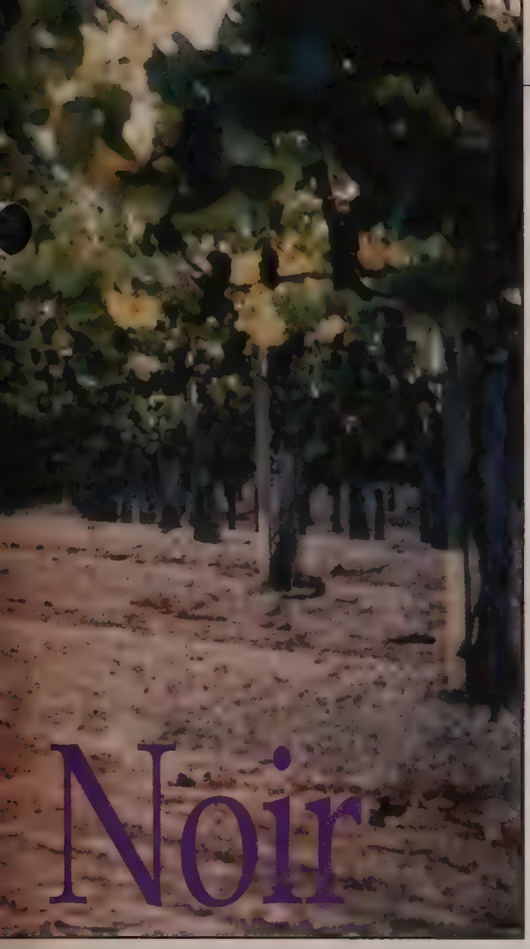
Located on Westside Road in Healdsburg, vines averaging 12 years old are planted on several rootstocks with different spacings. Clonal selections are 2A, 1A, and 9.

Winemaking

Depending on fruit condition, about 25% berry crushing occurs along with up to 50% whole clusters. Inoculation with Assmanshausen yeast is done after a 24-36 hour soak.

The cap is punched down four times/day for 15 minutes in open-top, 5x5x4 fermenters. Fermentation lasts 6-8 days with maximum juice temperatures of about 85° to 90°F. Pressing occurs at dryness. Press wine is usually added back.

One to two weeks after pressing, the wine goes into new to three-year-old, 60-gal, center of France barrels for 12 to 18 months. After MLF completes, SO_2 is added. Wine is racked once and bottled unfined and unfiltered, or with only a light pad filtration.



Noir regional style emerges

DEHLINGER

Fred Sherrer, winemaker

Vineyards

Several blocks, spaced 8x10, between Sebastopol and Forestville, were planted in 1975, 1982, and 1989. Budwood was sourced from Smith-Madrone Vineyard and Joseph Swan. Clonal selections are UCD #4 (most likely) and a Swan selection made in the late 1970s.

Relative to neighboring properties, these locations have the unique characteristic of rapid sugar accumulation. When grapes are allowed to achieve rather high sugar levels, the reward is expressive wines with strong personality and abundant black cherry flavors.

Winemaking

Very few berries are crushed because the preference is to gently break berries gradually during fermentation. The amount of whole clusters depends on the typical balance of the area, maturity, stem flavor, and the amount of whole clusters employed in fermentations probably destined for the same bottling. "We are thinking of the blends as we sample, and review our thoughts as we harvest," explains Sherrer.

A number of ADY (Pasteur Red, Assmanshausen, RA-17, Enoferm Burgundy, and RC212) have been used as inoculants in separate fermenters, typically during the second day after harvest.

The cap is punched down once or twice daily during the 7-10 day fermentation in open-top fermenters (7-feet wide and 5-feet high). Maximum fermentation temperatures reach 28-32°C (82-90°F) after punching.

Once malolactic fermentation is going in one puncheon, it is spread around to others at a rate of 5-10% v/v. Sometimes, a puncheon will undergo MLF with *Leuconostoc* without having been inoculated. "If it looks like good stuff, we will inoculate others from this," Scherrer notes.

Pressing is done when appropriate extraction has taken place. This occurs from immediately at dryness, to several days after dryness. The cap may ultimately become fragmented, but it has not been allowed to sink.

"We watch what comes out of the press at any particular point during the press cycle and then decide if it makes sense to stop pressing," Scherrer says. "Press fraction composition changes radically during the pressing operation. By operating the membrane press as though it was a basket press and not being greedy, we feel confident that the wine is balanced by including the press fraction."

Soon after pressing, wine on light lees goes to French oak cooperage, ranging in age from new to four-years-old. The Goldridge bottling goes principally into 228L barrels for about 12 months. The RRV Estate goes mainly into 500L puncheons for 12-18 months. The Reserve goes into similar cooperage as the RRV, but usually for several months longer.

A first racking is done in January or February following harvest with a second done in the summer. Although rarely needed, fining is done with egg whites. Goldridge is bottled when it is about 14-15 months old. RRV and Reserve are bottled between 16-23 months after harvest.

GARY FARRELL

Gary Farrell, winemaker

Vineyards

Vines, principally Rochioli Vineyard budwood, averaging 5-20 years old and spaced 6x10, mostly on AxR-1, are located along Westside Road.

Winemaking

Farrell estimates that 10-25% of the berries are crushed. Depending on the vintage, anywhere from none to 50% whole clusters are incorporated.

After 18-36 hours soaking, grapes are inoculated with several yeast types, but primarily Assmanshausen. In the past, uninoculated tanks have had successful fermentations, but mixed overall results.

The cap is punched down four times/day for 15 minutes during the nine-day fermentation in 5x5x4 open-top fermenters, where peak juice temperature reaches 85-90°F.

Three to five days after pressing, wine on light lees is transferred to new to two-year-old French oak barrels for 14-15 months. Generally, wine is not racked, but if it is, it's done in January following harvest.

The wine is bottled approximately 16 months after harvest, unfined and unfiltered, or with only a light pad filtration.

PORTER CREEK

George Davis, winemaker

Vineyards

UCD clonal selections #13, 2A, and 1A, and Paul Masson vineyard selection were planted 20 years ago on AxR-1, St. George, or 3309 rootstock spaced 8x10.

Winemaking

About 10% whole clusters are used and berry crushing is in the range of 20%-30%. The juice in open-top tanks measuring 7x5, is not inoculated (since the 1992 harvest). Fermentation starts about 3-4 days after crush. Porter is sat-

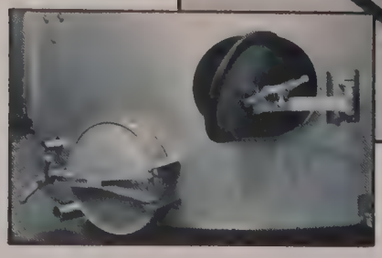
isfied with this fermentation, but has found it necessary to use higher levels (about 50ppm) of SO_2 at crush to keep VA levels in line.

The cap is punched down twice daily during fermentation lasting 10-12 days. Maximum fermentation temperature is 85°F.

After MLF completes in tank, wine is transferred to 30% new French oak for 16 months. In barrel, free SO_2 levels are maintained at 15-25 ppm. First racking is done in spring and is followed by one or two more, as needed.

Before bottling, wine is egg white fined.

Fermenting Tanks



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ROCHIOLI

Tom Rochioli, winemaker

Vineyards

At several locations in the RRV, vines from budwood isolated in one of the Rochioli vineyards, averaging five to 24 years old on AxR-1 rootstock, are spaced 8x12 or 7x10.

Winemaking

To contribute intensity and slow fermentation, about 60% of the berries are crushed and 20%-25% whole clusters are used in fermentations, some lots inoculated with Montrachet ADY and others uninoculated. Inoculated lots are given a 48-72 hour cold soak.

Over a 10-day fermentation where maximum temperature reaches 85°F, the cap is punched down three times/day.

After pressing, wine is transferred to new to three-vintage-old French oak barrels for 15 months. Wine is racked once in spring and again at bottling. It is not fined and rarely filtered. (The filtration decision is based on the Brett cell count. In some vintages when there is a small number of cells, the wine is put through a light pad filtration at very low pressure.)

RODNEY STRONG

Rick Sayre, winemaker

Vineyards

About 26 years ago, clonal selection FPMS 15, sourced from Louis Martini, was planted on AxR-1 rootstock spaced 8x12. Grapes are picked when the berries begin to shrivel and a few raisins are observed.

Winemaking

Berry crushing is in the range of 60%-75%. About 20% stems are added back because the vineyard source needs some tannin and perfume from stems.

After a 2-3 day cold soak, a variety of yeast types are used. For 30 minutes, twice daily, the cap is both sprinkled and pumped over in 3,500-gal closed top fermenters measuring 5x12. Fermentation completes in 4-5 days with peak juice temperatures at 85°-90°F.

As soon after pressing as possible, wine is barreled with light lees in 50% new cooperage (60% French and 40% American), for 12-14 months. First SO_2 addition is 20-25 ppm at the crusher and an addition of 50 ppm is made after MLF completes.

Wine is not racked, but after barreling, an egg white or gelatin fining is made, only if necessary. One pad filtration is done before bottling.

WINDSOR

Carol Shelton, winemaker

Vineyards

The wine is generally a blend from several vineyard sources including some near the winery.

Winemaking

Because rollers have been removed from the crusher, very little berry crushing occurs (about 60% whole berries). During crushing, about 0.5oz/ton Super VR enzyme is added to enhance color extraction at the start and clarity during ageing. About 10%-15% of stems are added back for structure and spice qualities.

The wine is often a blend (made in the fermenter) of 5%-10% Petite Sirah and/or Alicante Bouschet. Shelton maintains that the vineyard source is beefed up in color, tannin, and spice by the blending varietal(s).

One day after crushing, several yeast strains (French Pasteur Red, RA-17, Burgundy, and Lalvin 2056) are added as cultures originally started from ADY to add complexity to separate fermenters.

In 10-ton, closed-top fermenters, fermentation lasts about five days, with juice temperature peaking about 85°F. The cap is wetted by pump over through a sprinkler 30 minutes twice/day. The wine is pressed at dryness or within 5-7 days and is barreled as soon as possible in a mix of new to two-year-old American and French oak (average mix is 60% American and 40% French) for 10-17 months depending on age of barrels.

Wine is not racked, but if clarification is needed, a light granular gelatin or egg white fining is done. Before bottling in March, 18 months post-harvest, the wine is put through a light pad ahead of the filler. ■

PWV thanks Windsor Vineyards for hosting the discussion and tasting.

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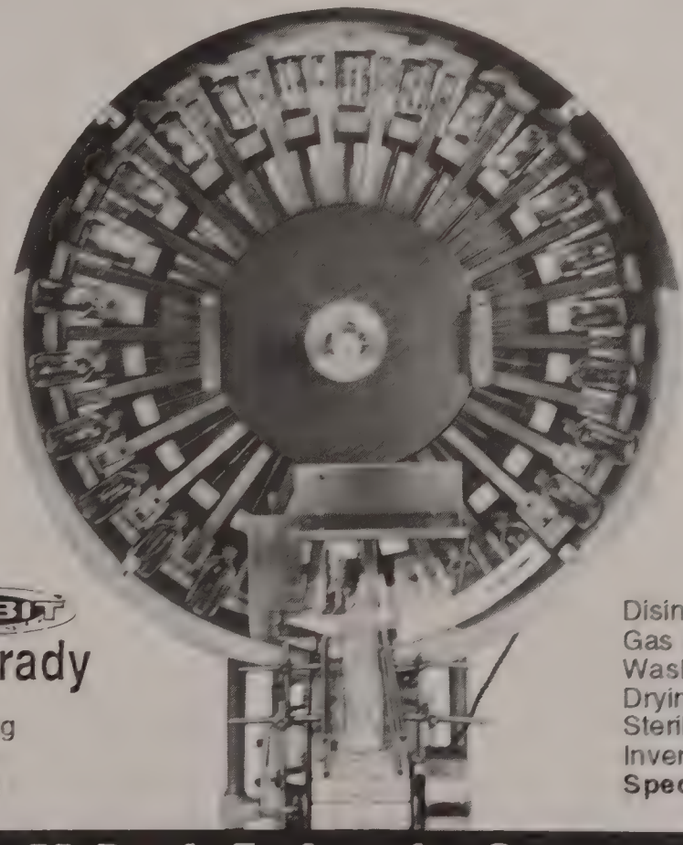

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New shelters for young vines

Grapegrowers testing new plastic shelters to protect newly planted young vines report increased vine growth over unsheltered vines or those in milk cartons. Though the plastic shelters cost more than milk cartons, some can be used more than once and demonstrate other advantages.

In addition to enhancing growth, plastic shelters protect vines from chemical sprays and from rodents, rabbits, and other herbivores during critical early growth. Plastic shelters can also reduce training costs, since no strings or training stakes are necessary with some shelters.

Other possible benefits include a reduced need for irrigation due to the high humidity and condensation inside the shelter, reduced wind and frost damage, and possible reduction in insect populations.

No California grower has reported a powdery mildew problem using plastic shelters, although an Ohio grower did experience a downy mildew problem in August, requiring removal of the shelters.

Trials at Beringer Vineyards

In 1994, Beringer Vineyards, Napa Valley, CA, used plastic shelters on dormant bench-grafts of several white grape varieties with good success in Napa Valley and the Carneros district. "We reduced our training costs and increased the caliper and length of new shoots on vines planted early in the season," reports viticulturist Drew Johnson. "We removed the shelters before the end of the season to allow tying of the shoots to the trellis wire."

Beringer used the white VTS supertube-shelter from the Treesentials Co. made of an ultraviolet (UV) stabilized plastic polymer constructed in a seamless twin-walled tube ranging from 3½" to 4½" in diameter and the light green Maclean Vine Guard from Australia made of UV stabilized plastic polymer with a single wall and 3-inch diameter.

In the Carneros district, where Beringer planted new Chardonnay dormants in an irrigated vineyard later in the 1994 season, the shelters reduced training costs and allowed summer herbicide spraying. They remained in place through the winter and will be removed in 1995.

How to use plastic shelters

Plastic shelters are available in stock sizes from 24 to 44 inches high, with diameters from 2¾ inches to 4½ inches. Custom heights are also available.

Suppliers recommend installing plastic shelters at the same time vines are planted. Green plant material should be planted with the graft union several inches above ground, and possibly covered with sawdust or rice hulls to protect the graft from potential heat problems. Be sure that the graft unions are firmly adhered.

Once the young vine is planted, place the shelter over it. Seal the bottom of the shelter by pressing it down into the soil two inches to maintain the microclimate, prevent loss of water and entry of herbicides.

Gro-guard shelter (Australia)

Shelter types

The lifespan of UV-stabilized polymers is three to five years, depending on elevation, latitude, and storage methods (shelters stored out of the sun when not in use last longest), according to the Treessentials Company, manufacturer of the Vine Training System (VTS) Supertube. This means growers should be able to get two or more uses out of most plastic shelters.

Shelters come in different opacities depending on the nature of the material used. The opacity affects the amount of light energy transmitted, and the heat and moisture retention potential; so consider this when choosing a plastic shelter. Vine-grow shelters are fabricated from transparent blue-tinted polyester film (PET). The light green Greensleeves from the Mer-Nel Company is .015 mil thick polyethylene with a UV inhibitor and comes in 2¾" diameter.

Gro-Guard shelters are corrugated twin-wall white or translucent polypropylene and have been used successfully in Australia since 1989 with own-rooted cuttings, callused cuttings, bench-grafted rootings, green, mist-propagated material, and green, micropropagated material.

Shelter considerations

Use of elemental sulfur in conjunction with plastic shelters is not recommended because the vapor is trapped and could burn the vines. Sulfur will also damage UV stabilizers and shorten the life of the shelter.

Suppliers recommend against removing the shelter before there are at least four fully expanded leaves growing beyond the top of the shelter. According to Gro-Guard, leaves grown inside the shelter do not always survive transition to an unsheltered environment. If the shelter is removed too soon, the vine may lose all its leaves, resulting in a setback.

When shelters are removed at the end of winter, there will be an accumulation of dead leaves on the shelter walls. Pathologists recommend that such waste be removed and shelters be washed with soapy water or dilute chlorine bleach. A high-pressure gun would be helpful to remove soil and other debris. ■

By R. Corbin Houchins

Taxation without representation

One of the political theories our nation's founders believed they were testing was the social contract. Under a version popular in 1776, the government would receive the right to exact taxes only from people represented in its deliberations.

After adoption of the federal constitution in 1787, state governments, having ceded the lucrative power to collect duties on imported goods, scrambled to support even an 18th century budget. Old World and colonial precedent lay ready at hand for collecting excises on business transactions of non-citizens and visiting non-residents. You can fill in the rest.

Today, any business that sells across state lines has to deal with the fervor of the tax gatherer in jurisdictions where the business owner is not formally represented. The Supreme Court has issued ground rules that uphold the "foreign" tax when sales activities by a manufacturing business in State A directed to its distributor in State B constitute "sufficient contacts" with State B.

Those intrigued by the interplay of conflicting Enlightenment political theories are referred to John Locke's concept that a government obtains tax power over goods by providing the common benefits that makes their enjoyment possible, such as police to keep thieves from walking off with them and courts to resolve commercial disputes.

Meanwhile, State A has its own excise on revenues derived from the outgoing sale — the same dollars that are also taxed by State B. The double tax bind is frequently encountered in packaged goods distribution, but is not inevitable. How might a vineyard or winery minimize revenue excise taxes from other states?

A troublesome example

For good or ill, there is no uniform state tax code. Much less is there uniformity in the regulations, policies, and procedures applicable to taxes on out-of-state businesses.

There is, however, a typical pattern worth using as a hypothetical example. It is the revenue excise known as a "business and occupations tax." Often it appears as a practical substitute for the politically more controversial net income tax. For convenience, I will refer to all excises calculated as a stated percentage of the gross revenue from a commercial sale of goods as "B&O taxes."

Now that the federal government appears bent on moving more of the expense of the common weal onto states and individuals, we can anticipate more barrel-bottom scraping from state revenue agencies. Form letters are doubtless going out at this moment, casting the B&O net toward manufacturing businesses known to ship into the state. Because in many states non-resident wine shippers appear in alcoholic beverage control agency records, our industry is a visible target.

Tax advice and planning are obviously beyond the scope of a column and a fit subject for the tax advisor of every winery and vineyard. We can, however, look at an illustrative scenario that may focus attention on one area of exposure from out-of-state shipments. It involves packaged goods, but the same principles apply to interstate sale of fruit.

Keeping one's head down

Winery liability for State B's B&O taxes ordinarily requires three elements.

First, there must be a purchase of wine by the distributor located in State B. Second, the winery must deliver the goods in State B. (More about that later; it isn't as promising as it looks.) Third, the winery must, at the time, have had sufficient contact (usually referred to as "nexus") with State B to give the state the constitutional power to tax it.

If you don't have nexus, the fact that potentially taxable revenues were derived from sale of wine delivered in state B is irrelevant. How, then, does one avoid nexus?

Most states have at least informal guidelines based on constitutional limitations, usually couched as factors used to find nexus. The most common factors applicable to the typical winery-wholesaler relationship are:

- A winery office in the distributor's state, even if it is essentially an answering machine and mail drop.
- Providing warehouse premises or equipment, or management services, for the distributor, even on a temporary basis.
- A toll-free number for telephone orders.
- Retaining title to goods pending payment, as distinct from taking a security interest in the goods.
- Taking back title to goods in the distributor's warehouse, *e.g.* for a shipment to another distributor to balance inventory.
- Signing the distribution agreement in State B, especially one specifically adopting State B law and putting venue in State B courts. (I have to ride a familiar steed here: **Do** use a signed agreement if at all possible. Provide in the agreement and the covering letters that it is accepted only at the winery; *i.e.*, the distributor signs first. Never, never adopt the distributor's law unless the winery is in a state with worse law; as of this writing, wineries in, *e.g.*, California, New York, Oregon, and usually Washington wineries should attempt to choose their own law. The choice will, alas, probably be ineffective in so-called franchise states such as Massachusetts and Virginia, but at least you won't fall into the trap of voluntarily accepting the state's court system. John Locke and all that, remember?)
- Extending credit to wholesalers, especially if it involves advancing cash or cash equivalents.
- Keeping a bank account in State B.
- Suing anyone in State B courts.
- Participating in retail shelf sets or building displays.
- Making visits to inspect the condition of distributor or retailer inventory or to swap out-of-condition product.
- Making sales calls on the distributor.

- Making retail sales calls with the distributor.
- Employing a resident of State B.
- Visiting the distributor to deal with a delinquent account.
- Advertising in local State B media• Incorporating your business in State B. (Delaware, a state many lawyers prefer for incorporation irrespective of the home state of the business, has a B&O tax, by the way.)
- Registering with the secretary of State B as qualified to do business in the state. (This can be a trap in states that require non-resident sellers to hold permits or to register as the "primary source" of the brand. Briefly, a state can require any out-of-state business to qualify if the business first has sufficient contacts to satisfy the constitutional requirement for subjection to taxation. However, alcoholic beverages have their own constitutional provision granting states extra power. Thus, the state can require a winery to qualify as a precondition to issuing the permit, even though it could not require qualifying on the basis of contacts. It can then use the contact provided by qualifying as an argument that sufficient nexus exists to tax. Probably because B&O taxes are relatively small, that reasoning has not been directly challenged so far as I know, but it may be a bit shaky after the recent *Paradise Beverage* decision.)

Almost the only way to avoid all the factors is to send your wine off for cash and never hear from it again. However, not all the factors in themselves automatically result in nexus. It is possible for a winery with third-party contractors (not located in State B) doing all the field work to avert a finding of nexus. Some sellers may be able to market effectively while avoiding significant contacts with State B.

For most sellers, the more important tax planning would be directed to the other controllable variable, the location of delivery.

Thinking nationally, selling locally

One might think that selling FOB the State A winery and putting the goods on a carrier engaged by the State B distributor would constitute delivery in State A. Not to the tax collector.

States imposing taxes on a sales transaction generally regard goods as delivered where the buyer has the right to inspect and accept or (if they do not conform to order) reject them. That is State B unless the parties agree otherwise. What, then, could be added to the sales documents to shift delivery to the winery dock?

Passing over many interesting legal wrinkles, the simplest approach, if the distributor will cooperate, is to put a provision in the distribution agreement and invoices that the sale takes place at the dock and that the carrier transporting the goods is authorized by the buyer to accept them there. The bill of lading would then list the buyer as both the consignor and the consignee.

More elaborate arrangements could be put in place, including shipping to a State A location that would handle everything from there as agent of the buyer. (Thinking these moves up is one of the things that make tax accountancy so much fun.) The point is that diligent marketing of wine is likely at least to give the State B revenue department a good argument for nexus, which is a flexible concept, and wineries would thus be well-advised to look at the delivery site factor, which can be determined more precisely.

What is it worth?

This is perhaps a lot of discussion for a small tax bite. At present rates, I doubt the average winery's out-of-state revenue tax bill would reach five figures annually, even if every state enacted and pursued B&O taxes to the hilt. Under current enforcement policies, most wineries will never hear from State B.

Nevertheless, I think the issue is important because we are a tempting tax target with less protection than other industries from state-by-state government action. It's not a bad time to do a little interstate tax planning. ■

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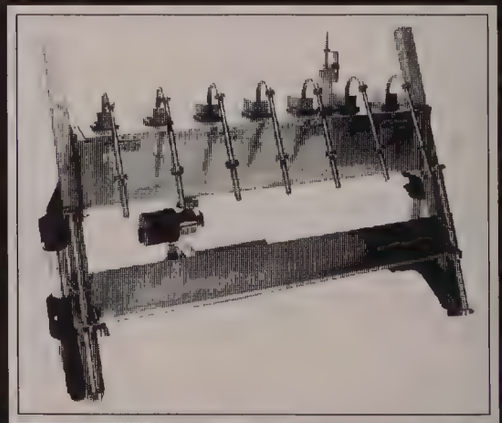

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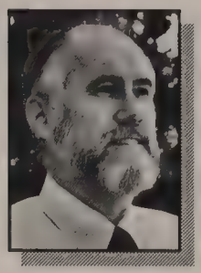

By D.R. Storm, PhD, P.E.

Choosing the best T.P. for your septic tank

Your winery's purchasing agent most likely bases procurement decisions on the criteria of cost and quality. Your staff and management probably give toilet paper purchases very little attention (except, of course, when there is none.) For the sake of your septic system, give your toilet paper brand some attention now.

Though I am unable to cite the original investigative work on the effects of various commercially available toilet papers on septic tank performance, I can describe the basic findings of a report I read some 20 years ago. The investigator was either faculty or a graduate student at the University of Connecticut, Storrs.

A University of Connecticut researcher discovered that some toilet papers disintegrate more quickly than others in the digestion compartment of conventional septic tanks. Since the 1960s, the so-called "wet strength" of paper towel products that resist disintegration has been touted as an advantage. But it's no advantage for your septic system.

According to the study, those tissues that did not disintegrate in the normal digestion compartment residence time of 1.5 to two days would often be transported vertically by evolving digestive gases and pass over the weir or connecting pipe between the digestion compartment and the "clear" compartment, eventually being carried to the leachfield. You can easily imagine the clogging potential of these paper residuals in the soil absorption system.

The wet strength factor compounds the problem for environmentally-correct wineries, that rightly choose to use toilet paper made in part or totally from recycled paper. The "wet strength" characteristic is often retained in the finished recycled paper. Apparently the pulping and de-inking process that occurs during the paper recycling process does not alter the strength characteristic of those fibers.

Fortunately, the solution to this problem is at hand. Special toilet papers have been designed for the delicate wastewater systems of pleasure boats with holding tanks, RVs, and corporate aircraft with in-flight toilet facilities.

Marine chandlers or RV-service centers carry the magic T.P., and it can be found under the "Marina" brand name in many local supermarkets. The fiscal impact of converting to this brand is insignificant, but it is certainly one more way to prolong the life of your very important leachfield system.

CRYPTOSPORIDIUM

Waterborne parasite is causing problems

Anyone who has studied the life cycles of parasitic protozoans knows they are very persistent bugs that have developed (in an evolutionary way), a protective system that allows their survival under conditions that would be destructive to less-protected, but dangerous pathogens.

The bothersome protozoa of the 1980s was *Giardia lamblia*, which produced "backpackers' disease," as it became unfondly known. Giardia infections were endemic in many areas of the U.S. where raw stream water was drunk by unsuspecting hikers and campers. The problem parasite of the 1990s appears to be *Cryptosporidium sp.* (Figure 1 depicts the life cycle of *Cryptosporidium sp.* and suggests the array of mammals that can serve as hosts.)

Cryptosporidium sp. has many of the same strategies for survival and infection as Giardia:[1]

- In the oocyst stage, *Cryptosporidium sp.* is able to survive and remain infectious outside of its warm-blooded hosts for 12 to 18 months in an aquatic environment;
- In the oocyst stage, it can survive free chlorine dosages of 2,000 mg/l. (By contrast, most potable water treatment systems use a dose rate of 5-10 mg/l of chlorine. For further reading on the subject of disinfection, refer to **PWV** Vol. 8, No. 5, Winery Water & Waste.)
- This protozoan's reproductive capacity is excessively large with infected animal host feces containing 10^6 to 10^9 infective oocysts per day;
- It has the ability to cross-infect among a large number of terrestrial and aquatic mammals; and
- As low an infective dose as a single oocyst can produce Cryptosporidiosis in humans.

Why be concerned about Cryptosporidium?

Since 1987, there have been four major outbreaks of Cryptosporidiosis, three in the U.S. and one in Great Britain.

Table I
Outbreaks of Cryptosporidiosis in the U.S. and England 1987 to 1993.[1]

City	Date	No. of illnesses	% of population exposed
Carrollton, GA	2-87	13,000	40%
Oxforshire, Scotland	1989	55,000	11%
Jackson County, OR	2-92 to 6-92	15,000	9%
Milwaukee, WI	4-93	320,000	23%

Table I is taken from Reference 1 and shows the magnitude of the outbreaks and geographical location:

What was common in all the locales where the disease proliferated was that all communities were served by a surface water supply. Treatment of the raw water was accomplished using conventional water works practice of coagulation, sedimentation, filtration, and disinfection.

Epidemiological studies have shown that treated water in these communities met or exceeded the required bacteriological standard of purity before and during the epidemics.

Public health investigators discovered that, in all four instances, the *Cryptosporidium sp.* oocysts were reintroduced into the clean water (post-treatment) by improper operation of the sand filters (*i.e.*, starting the filters without backwashing or recycling backwash discharge to the filters for repeat back-

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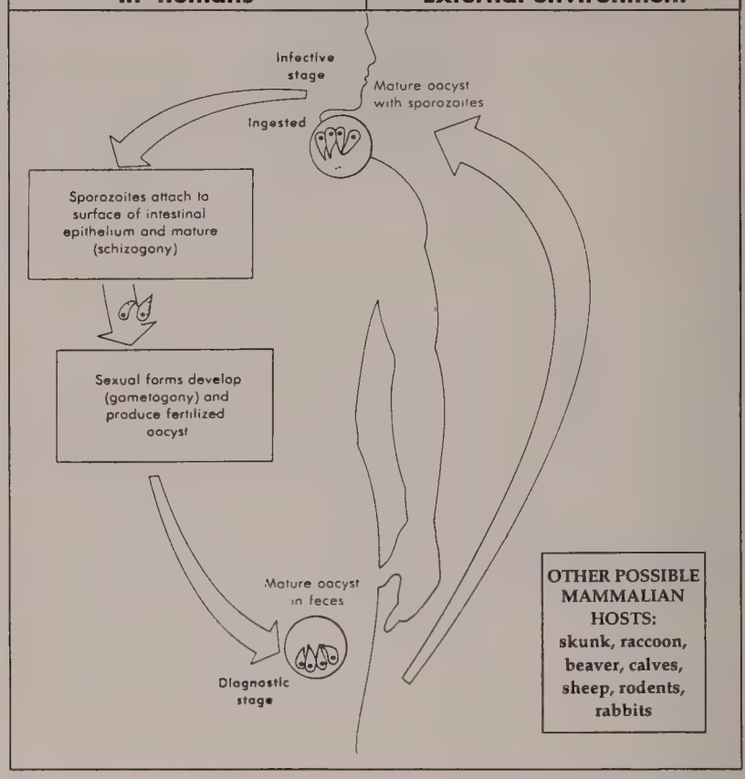
Figure I Cryptosporidium life cycle (from Reference 2)


In humans
External environment
Infective stage
Mature oocyst with sporozoites
Ingested
Sporozoites attach to surface of intestinal epithelium and mature (schizogony)
Sexual forms develop (gametogony) and produce fertilized oocyst
Mature oocyst in feces
Diagnostic stage
OTHER POSSIBLE MAMMALIAN HOSTS: skunk, raccoon, beaver, calves, sheep, rodents, rabbits

wash cycles.) Subsequently, of course, the water treatment facilities have changed their filter operating protocol to prevent the disentrappment of the protozoan oocysts and their reintroduction into the finished drinking water.

Are some wineries at risk?

Since October 1994, in the wake of the recorded outbreaks of Cryptosporidiosis, the U.S. Environmental Protection Agency (EPA), has imposed new requirements on all municipal water systems with surface supplies, or ground-water supplies under the influence of surface supplies (e.g., wells adjacent to streams or rivers) serving 10,000 people or more.

Monthly, for a period of 18 consecutive months, tests will be performed on these systems for *Cryptosporidium sp., Giardia lamblia,* and enteric viruses. The data coming from throughout the U.S. will be analyzed, and new regulations will be developed by the EPA to protect public health if the incidence of the organisms in water supplies is deemed critical.

Many wineries and vineyards draw water from "near-stream" aquifers, which have the potential for contamination with *Crytosporidium sp.* Those wineries and vineyards with surface water supplies and treatment systems that use rapid sand filtration might want to contact their local environmental health office for guidance in preventing, to the greatest extent possible, contamination of their potable water supply with *Cryptosporidium sp.* or other persistent pathogens. ■

David Storm is a consulting civil/sanitary engineer who specializes in winery utilities and is owner of Winters Winery.

References

1. "Protecting Drinking Water From Cryptosporidium sp." 1994. Southern, W. and R. Speiser, ***The National Environmental Journal,*** Vol. #5 p. 33-36.

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Continued from page 5

let's align linguistic reality with marketplace opportunity.

Allow all white wines, regardless of grape variety, to be labeled "Chardonnay," and all reds to be called "Cabernet Sauvignon." To the average American wine buyer, it would seem entirely reasonable to pick up a bottle of wine prominently labeled Chardonnay and read on the back label: "This Chardonnay is made 100% from the Riesling grape variety."

Kramer may have been writing with his tongue in his cheek, but if something isn't done to stop this trend in imports, varietal names will soon mean nothing.

Another problem

Complicating things further is the fact that the names of varietals and the science of ampelography are not sufficiently precise to enforce rules anyway. There is no scientific way to accurately distinguish the varietal composition of a wine. As a matter of fact, even in the U.S., we have had to be broad-minded. I have heard that some Pinot Blanc clones in the U.S. are really Melon.

Also, several years ago, I had to choose whether to call some of our vines Gamay Beaujolais or Pinot Noir! So what is to stop vintners in other countries from calling their Chenin Blanc, Chardonnay — their Cabernet Franc, Merlot? Can we cry foul?

Twenty years ago, we were contending our legal right — and some of us still do — to use European appellation names on our wines. Isn't it worse for California wines to be called Burgundy, Chablis, or other such names than for other countries' wines to be called Chardonnay or Cabernet when they are something else? U.S. wineries are on shaky ground here.

Changing the principle identifier

Misleading labeling is a very serious problem confronting U.S. wine producers. I feel the only solution, other than sending in the Marines, will be for us to change the emphasis of our denominations from varietal to appellation. This is a long and hard process, but possible. If we all start emphasizing our appellation as well as the varietal when denominating a wine or putting it on a list or shelf, the change will slowly happen.

Let's start changing the way we teach consumers to identify wines, so the identification will not be open to all the wines of the world, but only to ours, by using appellation rather than varietal names.

Change is constant in the U.S. industry and it is not random — it has a direction. Change in the U.S. industry has been a steady path toward truth — toward quality.

Twenty years ago, a prediction that almost 60% of all varietals sold in the U.S. would be Chardonnay or Cabernet would have sounded quite unbelievable.

Let's hope that 20 years hence we will have so identified and distinguished our numerous appellations that the regional name, more than grape varietals used, will give a wine its recognition.

Such a change will protect us from the sea of Chardonnay and Cabernet being prepared by our foreign competitors for sale in our market. It will also enhance diversity and distribution, taking us another step toward making our viticulture the most interesting and dynamic in the world. ■

Edited from a speech given at the Unified Wine and Grape Industry Symposium, Sacramento, Calif., Jan. 17, 1995.

Beware the dangers of pioneering

By Jay Conrad Levinson

In the world of marketing, it is heady and exciting to introduce a new wine or line of wines — especially when they have clear and dramatic product advantages. But for every giddy delight, there are 15 hidden horrors. Pioneers get to do it first, but they often end up with arrows in the backs of their necks.

"Originality is the most dangerous word in advertising," says Rosser Reeves, author and ad agency president. Heed well his words in your quest to be creative. And remember that creative, when it comes to marketing, does not mean awards or medals or compliments, but ***profits*** and nothing else. If it does not produce profits for your winery, it is not creative.

Rather than seeking the original and striving to be a groundbreaking pioneer, put the odds in your favor by going only with the proven. Study marketing books and periodicals to learn what is working for whom and how you can gain inspiration from others' success to fill you own coffers to the brim.

The waterbed industry is now a $2 billion industry. When in its infancy, the industry leaders offered to partner up with some of the biggest names in the innerspring market. "No thanks," they were told. "We have no doubt that you'll do well, but we've been pioneers before, and we don't want to be pioneers again." The innerspring folks were remembering that it took 20 years for the public to switch from stuffed mattresses to innersprings. Pioneering requires patience.

It has long been said that Procter & Gamble, a Hall of Fame marketing organization, tries to be **second** on the market with its products. "Let the others make the mistakes. Let us learn from them. Then let's do it right." Sounds like a guerrilla marketing adage to me, because guerrillas can't afford to make mistakes. They've got to get it right the first time. That's hard for pioneers.

Don't think that pioneers are always big companies. E&J Gallo was a tiny winery when it started pioneering in areas such as in-store signage. The brothers' hard work as pioneers made their winery the huge success it is. It didn't happen the other way around.

Wineries have the opportunity to do their pioneering in many areas. They can pave the way with new varieties of wine, new grapes, and new technical artistry. They can also break new ground in the area of packaging — boxes, bottles, front labels, back labels, neck labels, hang tags, and even foil and corks. Wineries can pioneer and prosper with signs, marketing weapons, customer service, and by tapping into the Internet.

Don't limit your breakthroughs to the process of winemaking only. Think about, and maybe even invest a little of your R&D budget on, the possibilities of making yourself distinctive and visible in the arenas of marketing, advertising, promotion, sales training, and fusion-marketing efforts with potential allies.

When you do decide to pioneer, be prepared for a long wait before your innovation is accepted. Contrary to public opinion, people ***do not want*** to be first on their block to own anything. Instead, they'd prefer to be seventh or eighth on their block. Fifteenth wouldn't be so bad either. They've made purchasing errors before, and they don't want to make them again. Waiting and seeing make more sense.

Experts tell us that as a rule of thumb, 2% of the population

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instantly embraces innovations. Another 12% joins them after a year, and after two years, 22% joins the band. This means that pioneers must have the financial capability to hold their breath for a long time. And even after that long time, 64% of American citizens are still waiting and seeing.

Whether your winery is developing a new wine or marketing one, realize that, regardless of the quality of your offering, human behavior will prohibit the instant gratification you naturally crave.

If science developed an anti-aging pill and the Food & Drug Administration granted instant clearance, it would be five to ten years before the majority of the population would take it.

Despite our resistance to the new, Americans accept innovations far sooner than Europeans. While working in England during the late 1960s, I was part of a presentation to the marketing committee for England's most popular anti-acne ointment. We recommended TV advertising aimed at teenagers. Their response — and this was in 1968 — "While we agree that teenagers are our primary market, we are not convinced that television is here to stay." Pioneers face that attitude on a daily basis. ■

(Jay Conrad Levinson is the author of international best-selling Guerrilla Marketing *books and* The Guerrilla Marketing Newsletter. *To order or request a free brochure, call 800/748-6444. In California, call 415/381-8361.)*

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Pioneering proprietary names

by Millie Howie

More and more pioneering occurs on the frontier of new wines and wine blends. For generations, winemakers in every wine-producing country in the Old World, and in the new, have put together blends of wines and called them by imaginative and sometimes descriptive names — proprietary names.

Some proprietary names, such as "Cold Duck," have become synonymous with entire categories of wine. And certainly, in the strictest sense of the word, weren't Chablis, Muscatel, Burgundy, and so on — those almost generic names representing wines and winemaking styles throughout the industry — once really proprietary names?

What has inspired vintners to develop these proprietary wines? Where do they get the names? Do proprietary names help or hinder success of a wine? ***PWV*** asked people directly involved with creating some of today's names to respond with their experience.

Sutter Home Winery

Since Sutter Home Winery (St. Helena, CA) introduced "Soleo" in six major population centers in the U.S. in 1991, the winery reports it has become the second best-selling Beaujolais-style wine in the U.S. A blend of 50% Zinfandel with Barbera, Pinot Noir, Napa Gamay, and a touch of Centurion, Soleo was introduced nationally in February 1992. Original production was 100,000 cases, selling at the winery for $3.99/bottle. Sutter Home now ships 150,000 cases/year.

"Because this wine was a blend, we needed a proprietary name; something that would reflect the lively quality of the wine," explains Stan Hock, Sutter Home Director of Communications. "We hired Landor Associates (San Francisco corporate identity firm) and told them what we were looking for in a name, and what consumer market we were targeting.

"They came up with Soleo, which worked well, first because it had the root word 'sol' with the imagery of the sun and, secondly, it evoked the spirit of the Mediterranean, which was important to us."

The name has been a hindrance in some areas, admits Hock, because it doesn't tell consumers enough about the wine. So Sutter Home had the packaging redesigned in 1994, but to help customers identify the wine style and what to expect.

In the original packaging, Soleo looked like just another Sutter Home varietal. Now, the new flint bottle lets consumers see the wine's color. Combined with a festive ceramic label fired onto the bottle, it's a real traffic-stopper.

In the long run, Hock feels the name will be beneficial. "It is clearly ours alone, and people now associate it with Sutter Home."

A companion product from Sutter Home's sister winery, Montevina, called "Brioso" has had less success. It is 100% Zinfandel (4-5,000 cases/year) and is a strong wine-by-the-glass selection.

"When people taste the wine, that's enough to sell them, but retailers and restaurateurs dislike having to explain what the wine is," comments Hock.

To help sales, "Zinfandel" has been added to the label of the 1993 vintage (released in January, 1995). With this identification, Hock predicts the wine will get good reviews, which will sell it to the trade and thus to consumers. Hock adds: "We're prepared to spend some time getting both wines established."

St. Julian Wine Co., Inc.

Eight years ago, St. Julian Wine Company (Paw, Paw, MI) released a line of popularly-priced wines called "Village Wines," a red, white (with 2% r.s.), and a blush (3.5% r.s.). Proprietary names were chosen because the wines were made from hybrid grapes.

In 1993, St. Julian introduced "Great White" (a blend of Seyval Blanc, Vignoles, and a bit of Chardonnay) to fill a need for a completely dry white. Great White and the Village Wines are marketed together in the same retail price range, about $4.99/bottle.

More than 5,000 cases/year of Great White are produced and distributed in Michigan, Ohio, Indiana, and Illinois, and the wine will soon be available in Missouri and Kansas.

Chaz Catherman (winemaker) reports that this was St. Julian's second success developing proprietary wines in response to consumer demand. "We first had feedback from consumers visiting our eight tasting rooms, and from our tasting room managers, that there was a need for a red wine that had a little sweetness. We developed 'Simply Red,' a blend of Marechal Foch and De Chaunac, with 2% r.s. from Foch grape juice [several years ago]. It sold well, so we were certainly willing to try a white to suit consumer demand for something dry."

Chateau De Baun

Proprietary names at Chateau De Baun (Santa Rosa, CA) began with the grape variety, Symphony. In the beginning, every wine had a proprietary name — Prelude, Romance, Rhapsody — musical instruments illustrated the labels. "This confused the consumer completely," explains Tim Shippey, marketing director.

"Here we were pioneering a new grape variety, at a new winery, with non-wine names. Wine writer, Jerry Mead summed it all up precisely when he said De Baun wines had two chances at success: slim and none.

"We now have two proprietary names: Finale, (which is appropriate for a dessert wine since late harvest wines have a long tradition of proprietary names. In this category, people are not necessarily concerned with names, but with how it tastes.)

Stelle, because of its unique style and unusual packaging, sells itself. But most proprietary names call for a secondary name on the label, such as our Chateau Rouge Pinot Noir. People in the trade are asking us to make the words Pinot Noir [on that label] more prominent.

"This is such a tradition-bound industry that if you go outside the general perception, you can find your own uniqueness a hindrance.

"The 1992 vintage of Stelle has done well. We doubled production in 1993 and expect to bottle 2,500 cases with the 1994 vintage. It has undergone some changes, but we feel with this vintage we know exactly what we want and what the public likes. It is in the Muscato d'Asti style. It has never been promoted, but with the 1994 vintage, we will have a program and some advertising support."

Stelle sells for $12/bottle, and about 50% of sales are in the tasting room.

Preston Vineyards

"We have made Muscat wine in various styles since 1977," says Lou Preston, owner of Preston Vineyards (Healdsburg, CA). "Our experience has been that it is an easy wine to sell, once tasting room visitors taste it. But too often, consumers hear the name and confuse it with Muscatel, which implies sweet and cheap — which an experienced wine drinker should not like.

"When we first produced this wine, 'Moscato Curioso,' the label was Curious Muscat, in English. We decided we needed to create a graphic to go with the wine, and an artist in Napa took a whimsical approach and came up with the portrait of the 'Curious Muscat.' We thought, people would see the poster and be lured into buying the wine. We sold many, many posters in the tasting room! So, we put the poster on the label, and Italianized it, because we like to think of ourselves as Italian in spirit."

Production is 200 cases/year selling for $10/bottle, mostly in the tasting room. It is a low alcohol wine (8% to 9%) with moderate sweetness (8.1% r.s.). "We try to capture an essence of the effervescence from fermentation, but that is very difficult," Preston concludes.

Breitenbach Wine Cellars

Introduced when the winery started in 1979 in Dover, OH, the six top selling wines at Breitenbach Wine Cellars are proprietary wines named Roadhouse Red, Frost Fire (the most popular), First Crush, Charming Nancy, Silver Seyval, and Festival. Breitenbach vinifera wines are labeled with the grape variety.

The proprietary blends consist of Native American and French-American hybrids, which are sweet and fruity. Owner/winemaker Dalton Bixler says consumers find the proprietary concept unique.

Roadhouse Red is a blend of Concord and Baco Noir. "When I developed this light, sweet wine," he recalls, "I was reminded of a story I read as a kid about some teenagers with a hot rod, who stopped by a roadhouse to dance."

Frost Fire is a blend of 100% Niagara, light, sweet and crisp with no foxiness. Grapes from different vineyards, show how much soil influences flavor. "Nature's frost fire," occurs in spring or late fall, when a heavy frost coats everything. The sun comes out and makes the frost blaze with color. The wine's crispness reminds Bixler of frost fire.

Charming Nancy is a Vidal, a pleasant sweet wine (2.0% r.s.). "It seems that everyone I met named Nancy is a truly nice person," says Bixler. "Then I found out that the first Amish in this part of the country arrived on a ship called Charming Nancy, so that made [the name] a natural."

Festival is a blend of Cabernet Sauvignon and Ravat, sometimes including Foch or DeChaunac, produced annually to commerate a big Swiss Festival at nearby Sugar Creek.

All six wines sell for $6.11/bottle. About 98% of the sales are at the winery, with select distribution in larger Ohio cities, such as Cleveland, Columbus, and Dayton. ■

Watch for Part II in May/June, 1995.

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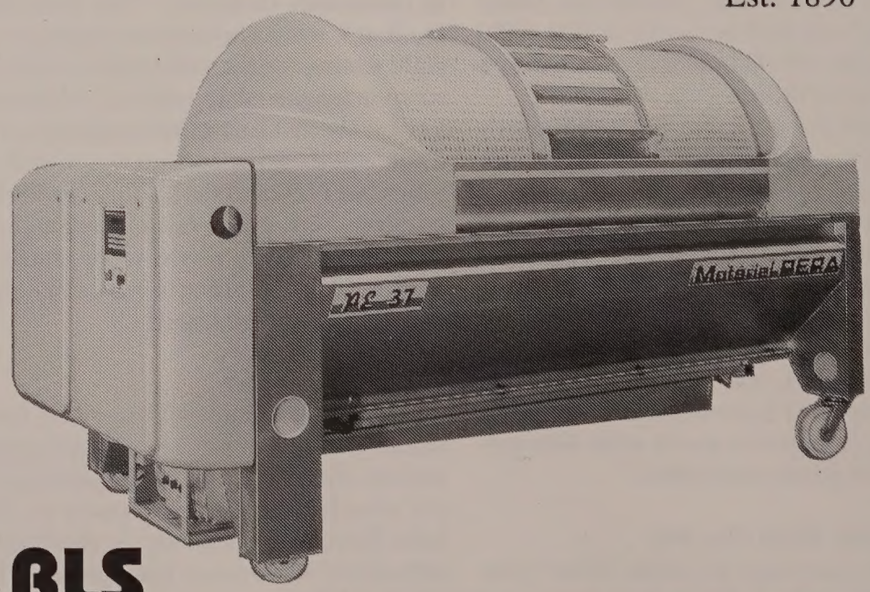

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